REPORT

ON

INFECTIOUS DISEASE

IN MANCHESTER,

BY JOHN LEIGH, M.R.C.S.,

Officer of Health for the City of Manchester.

Presented to the Health Committee, December 19*th*, 1870.

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In my first Report to the Health Committee, dated April 4th, 1868, I called attention to the large amount of preventible disease which constantly prevails amongst us, and its consequent mortality. I stated that nearly one-sixth of all the deaths in Manchester are, and have been through a long series of years, caused by infectious diseases, caused by the inhalation of an atmosphere poisoned with the emanations or exhalations of an infected person or infected persons. Such diseases as small-pox, scarlet fever, diphtheria, measles, whooping cough, and probably some forms of typhus, though they must have originated at some past time, yet never spontaneously break out in our days. Of the infectious nature of cholera I have no doubt; but as this is only an occasional visitant, I will confine my observations and statistics to the types of infectious disease almost constantly prevailing amongst us. These diseases when not actually present in our midst are always brought to the city by some infected person, and are communicated from one to another by infection only, with the single exception of some forms of fever which may originate from a vitiated atmosphere, that is, an atmosphere intensely vitiated by ordinary causes. If a case of small-pox were brought into a street and communication were held with the affected person, it is probable that a number of persons would be seized with the disease, and that several would die, although every house in the street might be white-washed and cleaned and the street put into the best sanitary condition. No doubt good ventilation would lessen the intensity of the poison, and favourable external circumstances might improve the chances of recovery of those affected, but they would not entirely check the spread of the disorder.

In the ten years from 1851 to 1861, there died in the *Registration District* of Manchester, from *five* infectious diseases only, 10,945 persons, and in Chorlton Registration District 5,604—a total of 16,549 persons. In looking at these enormous numbers, we must not lose sight of the fact that they represent an immensely greater number of cases. At present there exist no sufficient data to enable us to judge accurately what is the relation of deaths to recoveries from any particular disease. This has been a subject of discussion with my friend Dr. Farr, and I hope, with his assistance, to obtain tolerable approximations to the true numbers. From communications, however, made by the public medical officers in Manchester, Chorlton, and Ardwick, to the Manchester Sanitary Association, it appears that in their practice alone, and exclusive of what fell to the care of private practitioners, 31,575 cases of infectious disease occurred in the seven years 1861-7.

In the *Registration Sub-Districts* of Ancoats, St. George's, Market-street, London-road, Deansgate, Chorlton-on-Medlock, Hulme township, and Ardwick township, in the seven years 1861-7, there have been 70,399 deaths from all causes, and of this number 10,443 have occurred from five infectious diseases.

The number of cases of infectious disease reported by the public medical officers of Manchester and the adjoining townships can only very imperfectly represent the actual number of cases occurring within those areas, a very large number coming under the treatment of private practitioners; and the proportion of deaths to cases—10,443 deaths to 31,575 cases—represents a proportionate mortality very wide of the truth.

Respecting the prevalence of the three diseases—typhus fever, scarlet fever, and small-pox—we obtain the following figures:—

Number of Deaths from Typhus Fever, Scarlet Fever, and Small Pox.

In the 10 years—1851 to 1860	10,763 deaths.
" 7 years—1861 to 1867	6,808 "
Annual average number of deaths during the ten years, 1851-60, from these three infectious diseases	1,076
Average annual number of deaths during the seven years, 1861-7, from these three diseases	973
Average annual number of deaths during the 17 years, 1851-67, from these three diseases	1,032

I have long held the belief, to which I have given expression in previous Papers, that the only efficacious mode of arresting the spread of infectious diseases is by isolation of the cases.

Disinfectants, as chlorine, carbolic acid, and other bodies, acting by decomposition or absorption, may do something in purifying an infected atmosphere, but their chief use is in cases where there is no renewal of the infection,—where the patient has been removed and the infection still lingers in the air of the sufferer's apartment, in the furniture, the bedding, and the apparel, as well as in the voided matter. But when every breath of the patient, every exhalation from his body, whatever indeed passes from him, is a source of fresh infection, it is idle to attempt to stop the spread of it by antiseptics or by disinfectants alone.

Looking at the general condition of the inhabitants of Manchester, and at the size and arrangements of their dwellings, it is obvious that isolation cannot be effected therein, with the rare exceptions of the large and commodious houses of the wealthier classes, wherein rooms can be shut off from the rest of the building, and the patient be separated from his family or the latter removed. But taking the houses of the working classes, wherein every room is necessary for the requirements of the families occupying them, it is simply impossible that the sufferer from small-pox, scarlet fever, typhus fever, can be separated from the rest of the occupants. The diseases infect one after another, and are conveyed to their neighbours and friends; and the frightful number of 16,539 deaths in the *Registration Districts* of Manchester and Chorlton alone in the ten years ending 1861, and 10,443 in the seven subsequent years, from five infections, is the result.

Isolation of the infected sick, then, means removal to an hospital, and this has led me to make an inquiry into the amount of hospital accommodation in Manchester appropriated to infectious diseases of the types I am now discussing.

In the Workhouse Hospital, New Bridge-street, there are 601 beds, of which 90 are reserved for infectious cases—fevers, small-pox, &c.

In the Manchester Royal Infirmary there are 250 beds, of which 32 are appropriated to infectious diseases.

In the Children's Hospital, Bridge-street, are 25 beds, of which 5 are set apart for infection cases.

In the Clinical Hospital, Park-place, Cheetham Hill-road, are 24 beds, occupied chiefly by children up to nine years of age, but no infection cases are at present received.

In St. Mary's Hospital are 40 beds for parturient and other female cases. No infection cases received.

In the Chorlton-upon-Medlock Dispensary and in the Ardwick and Ancoats Dispensary there are no beds or wards.

There are two hospitals situated, one at Withington the other at Crumpsall, which receive patients from Manchester. The Withington Hospital is connected with the Chorlton Union Workhouse, and contains 589 beds, of which 67 are appropriated to infection cases.

The hospital connected with the New Workhouse, at Crumpsall, is in connection with the Manchester Union, and contains 231 beds. I cannot discover, however, from the return made to me, that any of these are especially reserved for infection cases.

It thus appears that in Manchester township there are 90 beds in the Union hospital reserved for the infection cases of the pauper population, the patients received being chiefly adults, and that in the Chorlton Union there are 67 beds reserved for similar cases amongst the pauper population of that Union; that for the whole of the remaining adult population there are 32 beds reserved for infection cases, in the Manchester Infirmary; and that for the whole of the infection cases occurring amongst the infant population, in which I include children up to 10 years of age, there are just 5 beds in all Manchester, these being in the Children's Hospital in Bridge-street.

It is evident that, however desirable it may be, or however urgent the necessity to isolate cases of infectious disease, there is no present means of doing so in Manchester, *so far as regards a large portion of its population.*

It may facilitate our perception of what is necessary to be done if we divide the cases into two groups. Measles and whooping cough are the diseases of children, typhus mainly the disease of adults; scarlet fever affects with equal severity people of all ages, but occurs most frequently amongst children. Diphtheria is of rare occurrence, and may be classed with scarlet fever. I have drawn up a table exhibiting the ages at death from the five infectious diseases, in *Manchester Registration District*, at all ages, in the ten years 1851–60 :—

	Under 5 Years.	5—10.	10—15.	15—20 and upwards.
Small-pox	356	85	35	75
Measles	1462	80	5	3
Scarlatina	2531	829	114	48
Diphtheria	68	19	3	7
Whooping Cough	2176	98	4	0
Typhus	685	371	210	1664
Totals	7278	1482	371	1797

The total number of deaths at all ages from these diseases during the ten years was 10,928 (omitting a small portion of Newton) :—

The Deaths under	15	years being	9131
Ditto	10	"	8760
Ditto	5	"	7278
The Deaths over	15	"	1797
Ditto	10	"	2168

These figures make it clear that two-thirds of the cases occur in children under five years, and one-third in persons over that age.

It is necessary that we should have largely-increased hospital accommodation devoted exclusively to cases of infectious disease. On many accounts it is desirable that the wards, if not the hospitals for children, should be distinct from those for adults. Children require different treatment, different nursing, and different accommodation to what is required for adults. They require to be soothed and petted, and their surroundings to be lively and cheerful. Nurses accustomed to the sick wards of children acquire a manner which wins the confidence of the little sufferers, and the medical treatment is equally special. Children need to have everything done for them in circumstances where adults would help themselves, and the fact of their finding other children in the ward to which they are conveyed reconciles them to their position. Whether one large fever hospital should be provided, with proper divisions, or two or three hospitals founded in different parts of the city, is a matter for consideration; but whichever course is adopted, in all cases where practicable, the patients should be removed from the houses in which they are lying.

On the removal of the cases, proper fumigation and disinfection of the houses they have left should be adopted; and here it is that disinfectants are most valuable. In the disinfection of clothing and bedding a high temperature may be advantageously employed, though in a great number of cases the actual destruction of the clothes and bedding by burning is the best that can be done with them. All effete matters should be removed and the receptacles purified, and if necessary, the remaining members of the family be removed to another dwelling while all this is accomplished.

The publication of my Report containing these facts led to the holding of a public meeting in the Town Hall on the 30th July, 1868, at which a Committee was appointed "to inquire into the amount of hospital accommodation for febrile infectious diseases in Manchester." From the Report of the Committee I select the following passages:—

"In the absence of more detailed information from the hospitals, suffice it to state that from official sources, it may be concluded that in the two pauper hospitals, viz., the Manchester Workhouse and the Withington (or Chorlton Union) Hospitals, the actual deaths from febrile infectious diseases have recently been at the rate of 151 per annum.

"Beyond the Royal Infirmary there remains no other public hospital for fever which can be recognised in this inquiry, the Children's Hospital, Bridge-street, having only five beds for such cases, and these not in a separate wing to guard against infection.

"Now the Infirmary Board state, that during the past few years their weekly average of fever cases has not exceeded 15. If six weeks be allowed for treatment, this gives 130 cases in the year; which, according to the recognized average, yields 27 deaths in the year.* This added to the 151 deaths in the year at the two pauper hospitals,† gives a total of 178‡ deaths from febrile infectious diseases in all the public hospitals in the city in one year.

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* The actual average number of deaths for the last seven years is 34.

† The average number of deaths from these febrile infectious diseases for the last seven years in the Manchester Township (or Workhouse) Hospital, is 95·7.

‡ If the calculation for the Withington Hospital be correct, the actual average number for all the Public City Hospitals is 171·7.

"But it has been shown that on an average 973 persons *have died every year*, during the past seven years, of three febrile infectious diseases! And as the public hospitals account for only 178 deaths, there remains the large annual balance of 795 deaths which must have occurred in every year at the homes of the patients.

"The extent and gravity of this inquiry, however, can only be realized by calling attention to the fact that the large number of 973 represents the *deaths only* which have taken place each year from the three infectious diseases. The number of *cases* themselves cannot be computed to be less than 5,000 annually;* or during the seven years (1861-7) the enormous aggregate of 35,000 persons who have suffered more or less from typhus fever, scarlet fever, or small pox.

"*As to Hospital Accommodation.*

"It now remains to inquire what is the extent of hospital accommodation to meet the enormous amount of infectious disease just indicated.

"The following is a summary of the information obtained :—

Summary of the information received from the Four Hospitals.

Name of Hospital.	No. of Beds now set apart for cases of fever.	Total capacity for cases of fever.	No. of fever cases now under treatment	Are such beds in a separate wing?
Children's Hospital, Bridge-street	5	5	5	No: infection has thus twice spread to other wards.
Royal Infirmary	32	70	21	Yes.
Workhouse Hospital, New Bridge-street..	90	160	22	Yes.
Workhouse Hospital, Withington	60	100	28	Yes.
Total	187	335	76	

"The above list shows that the whole number of fever cases in the four hospitals at one time does not at present exceed 76; and that the total capacity of hospital accommodation for such cases is only 335.

"If these figures are compared with the 5,000 cases of fever which have occurred annually during the last seven years, it will be seen how small a share of relief to such cases the hospitals have afforded, and how inadequate their present utmost capacity would be to meet any crisis from an epidemic of a febrile infectious nature, if the cases occurring in children had to be provided for.

"Another point to be noted is, that of the 335 beds representing the entire hospital accommodation possible for these infectious cases, 260 are under the head of Pauper Hospitals.

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* The number of cases to each death is probably more than five.

DEATHS WITHIN THE CITY.

From all Causes.	From Small-Pox, Fever, Scarlet Fever, Measles, and Whooping Cough.	From Scarlet Fever, Measles, and Whooping Cough alone.	From Scarlet Fever, Measles, and Whooping Cough, under 10 Years of Age.	From Scarlet Fever, Measles, and Whooping Cough, over 10 Years of Age.	Deaths from Small-Pox and Fever only.	Deaths in the Manchester Infirmary.	Deaths in the Manchester Township Hospital.	Total Deaths in the Manchester Infirmary and the Manchester Township Hospital from Scarlet Fever, Small-Pox, and Fever.
9,114	1861. 811	457	Scarlet Fever... 95·4 per cent. Measles ...... 99·4 " WhoopingCough 99·82 "	4·6 per cent. 0 6 " 0·18 "	Small-Pox .. 11 Fever 343	1861. Small-Pox .. 1 Fever ...... 25 Scarlet Fever 1	Small-Pox .. 0 Fever ...... 19 Scarlet Fever 0	Small-Pox .. 1 Fever ...... 44 Scarlet Fever 1
9,072	1862. 1,190	844	.. ..	..	Small-Pox .. 19 Fever 327	1862. Scarlet Fever 4 Small-Pox .. 1 Fever 27	Scarlet Fever 0 Small-Pox .. 1 Fever 31	Scarlet Fever 4 Small-Pox .. 2 Fever 58
10,365	1863. 2,174	1,726	.. ..	..	Small-Pox .. 129 Fever 319	1863. Small-Pox .. 5 Fever 16	Scarlet Fever 1 Small-Pox .. 4 Fever 28	Scarlet Fever 1 Small-Pox .. 9 Fever 44
9,694	1864. 1,533	1,028	.. ..	..	Small-Pox .. 106 Fever 399	1864. Scarlet Fever 3 Small-Pox .. 6 Fever 37	Scarlet Fever 3 Small-Pox .. 1 Fever 43	Scarlet Fever 6 Small-Pox .. 7 Fever 80
10,886	1865. 1,561	809	.. ..	..	Small-Pox .. 96 Fever 656	1865. Small-Pox .. 6 Fever 30	Scarlet Fever 1 Small-Pox .. 8 Fever 159	Scarlet Fever 1 Small-Pox .. 14 Fever 189
10,756	1866. 1,622	798	.. ..	..	Small-Pox .. 27 Fever 797	1866. Scarlet Fever 3 Small-Pox .. 2 Fever 46	Scarlet Fever 1 Small-Pox .. 2 Fever 241	Scarlet Fever 4 Small-Pox .. 4 Fever 287
10,512	1867. 1,552	1,054	.. ..	..	Small-Pox .. 6 Fever 492	1867. Scarlet Fever 5 Small-Pox .. 0 Fever 20	Scarlet Fever 0 Small-Pox .. 0 Fever 127	Scarlet Fever 5 Small-Pox .. 0 Fever 147
						Average... 34·	Average... 95·7	Average..129·7

In my last general Report presented to the Health Committee, dated November 22nd, 1869, I felt it my duty again to call the attention of the Committee to the desirability of isolating the sick when suffering from infectious disease of the Zymotic class, and to the present insufficiency of Hospital accommodation, in these words:—

"If a person suffering from one of these diseases is capable, by the breath, by perspiration, or by the other excretions of the body, of infecting and charging the atmosphere surrounding him, so that it shall become poisonous to others about him and dangerous to their health and lives, and especially if the circumstances of his position are such as to interfere with his own chances of recovery, then it is clear, both in his own interest and for the public safety, that he should be isolated, and should, if possible, be placed under circumstances where skilled attendance, careful nursing, proper diet, ample ventilation, and such appliances as may be conducive to his recovery, may be brought to his aid.

"It is, unfortunately, a necessity of our social organization that there shall be one rule for the rich and another for the poor; but it is clearly the duty of the former—though it may perhaps be maintained that it is that of the entire body-politic—when suffering is brought to the homes of the poor of a character to endanger the entire household, to reduce the danger to a minimum and to make such provision as shall protect the household, whilst chances of recovery are given to the sufferer himself approximating to those enjoyed by his more fortunate brethren. In all matters relating to Public Health, however tardy we may be in learning the lesson, it fortunately happens that duty and interest go together. The suffering of the poor is the danger of the rich. The disease that lurks for a while in the hovel or the crowded court steals abroad and reaches the rich man's door. But it is here that the circumstances of the two make a difference. The rule for the rich is in his ample dwelling to isolate the sufferer,—to exclude from his presence those whom the pestilence has spared,—to destroy by disinfectants the pestilence as it is emitted, or to dilute it to the utmost by large draughts of air; though how unavailing even all this may be to save the stricken one, there is scarcely a family that has not a mournful remembrance. How is it, then, in the dwelling of the poor, with its small, stifling rooms, or perhaps single room, in which every member of the family lives and sleeps, ventilated only by the sickening and mephitic atmosphere that has swept over a hideous array of cesspools, carrying poison to the poisoned? Is it a matter of wonder that nearly one-sixth of the entire mortality of Manchester should be caused by five infectious, pestilential diseases?

"There can be no doubt that, with very few exceptions, persons suffering from infectious disease who require to avail themselves of Poor-law or charitable medical attendance, have not such home accommodation as is desirable for themselves or for the protection of others. But this number of cases, large as it is, is equivalent to only half the number of deaths recorded from these infectious diseases, so that there must be quite as many more cases that do not come under public medical treatment at all; and of this number a very large proportion of cases must occur in families whose position is but little raised above those in receipt of eleemosynary aid, and to whom the danger of infection is as great, and the want of conveniences and comforts to the sick as injurious, as in the class below them. To check the spread of these diseases, then, early removal of the sick and thorough disinfection of their dwellings is all-important; this disinfection including bedding, clothes, garments, and drapery of all kinds. A very efficient mode of disinfecting bedding and drapery is by the application of heat, a temperature quite insufficient to be injurious to the texture of the articles operated on having been found, in the researches of the late Dr. Henry, of Manchester, to be quite sufficient for the destruction of any infectious matter. Suitable ovens or stoves for the purpose could very easily be constructed in any of the yards belonging to the Corporation. Such stoves have for some time past been in use in Dublin, Liverpool, and Leicester.

"It has been shown that 31,575 cases in seven years represent scarcely more than one half the number of cases of infectious disease that must have occurred without the city during that period. If we average the deaths at one for each six cases, then during the seven years, 1861-7, there will have occurred on the average, in each year, 8,951 cases, and for these the entire hospital accommodation appropriated at the time of the report amounted to 187 beds. From the three diseases—typhus fever, scarlet fever, and small pox—there died in the city of Manchester during the seventeen years, 1851 to 1867, not less than 17,571 persons, or an average annual number of 1,032. As nearly as can be ascertained, 178 of these deaths occurred annually in the public hospitals, leaving the large balance of 854 deaths which must have occurred at the homes of the patients. It is quite clear, then, that the hospital accommodation provided less than two years ago, and which is practically the same at present, is quite insufficient for the number of cases of these three diseases alone, which normally exist in Manchester. But the fatal cases of these three diseases represent an absolute number of not less than 5,160.

"The small extent to which the scanty accommodation is made use of may be judged if we multiply by five, as in the other estimates, the number of deaths which have occurred therein to represent the number of cases received. The hospital authorities do not at present publish such statistics as will enable us to arrive at any closer estimate. The consideration of any but the three diseases, small-pox, scarlet fever, and typhus fever, is at present purposely excluded. The average annual number of deaths from these three diseases, during the seven years 1861-7, were—

In the Manchester Royal Infirmary	34·0
In the Manchester Workhouse Hospital	95·7

"It is believed that the number dying from these diseases annually in the Chorlton Union Hospital, at Withington, is about 42, giving a total of deaths in all the three hospitals of 171; but as the area of the Chorlton Union extends considerably beyond the boundary of the city, it is probable that the estimate of deaths from city cases admitted is in excess of the actual number.

"Adopting, however, the entire amount, we get 855 cases as the total number admitted annually for treatment in all the hospitals available for such cases to the population of Manchester, out of a total number of 5,160 cases.

"The zymotic cases admitted into these hospitals may, however, be practically limited to two forms of disease—fever and small-pox, as it appears that during the seven years, 1861-7, only six deaths occurred from scarlet fever in the Manchester Workhouse Hospital—rather less than one death annually; and in the Manchester Infirmary sixteen deaths, or rather more than two annually. It is probable that the deaths from scarlet fever in the Chorlton Union Hospital will also be very limited.

"From the smallness of the numbers, it may reasonably be assumed that the deaths represented by them were those of adults, a conclusion confirmed by inquiries made by the Officer of Health at the respective hospitals. It appears, then, that the three great hospitals situated in or connected with Manchester afford accommodation only so far as infectious febrile diseases are concerned to adults, and practically to those suffering from small-pox or fever, and that when any of the five or six common zymotic diseases attack the younger members of the community—say children under ten years of age—no provision exists for their isolation from the other children in the families to which they respectively belong, nor for securing to them such accommodation and conveniences as are in many cases necessary for their recovery; for it can scarcely be considered that the five beds appropriated to these cases in the Children's Hospital in Bridge-street—the only hospital which receives such cases occurring in children at all within the city—do more than call attention to the want of such accommodation, and yet in the ten years, 1851-60, the deaths of 8,760 children under ten years of age were registered in Manchester from six infectious febrile diseases, of which number 7,278 were under five years of age.

"It is the opinion of the Officer of Health, and was urged by him immediately on his appointment, that the most pressing sanitary necessity of Manchester is the establishment of receiving houses or small local hospitals in different parts of the city, to which children could be at once removed on becoming affected with any serious infectious zymotic disease."

Having in my first two Reports to this Committee and in the Tables furnished to the Committee on Hospital Accommodation for Infectious Diseases in Manchester (reproduced in the present Report), given an analysis of the mortality from Infectious Febrile Diseases in Manchester during the seventeen years 1851–67, I now beg to call your attention to the results of the reduction I have had made of the deaths from these diseases during the years 1868, 1869, and 1870.

The total number of deaths from small-pox, measles, scarlet fever, and fever in its various forms during this period of three years is 3,912, occurring in the different Registration sub-districts of the city in the following numbers:—

Ancoats	644
St. George's	719
Hulme	730
Chorlton-on-Medlock	384
Ardwick	258
London Road	256
Deansgate	311
Market-street	610

It will be seen from these numbers that the two largest districts on the eastern side of the city have furnished 1,363 fatal cases, or 34·8 per cent.; the two largest on the western side 1,114, or 29·4 per cent. If we join Ardwick sub-district to the eastern ones, with which it is connected, we get 1,621 fatal cases, or 41·4 per cent. for the eastern mortality; and if we unite Deansgate sub-district with the western ones, we shall have 1,425 fatal cases, or 36·4 per cent.

The population of Ancoats, St. George's, and Ardwick sub-districts is estimated in the middle of 1870 by the Registrar-General to be 137,724, which would give 11·76 fatal cases per 1,000 of the population.

The population of Hulme, Chorlton-on-Medlock, and Deansgate sub-districts is similarly estimated to be 161,040, which will give 8·80 fatal cases per 1,000 inhabitants.

The two central sub-districts are those of London-road and Market-street.

London-road sub-district furnished 256 fatal cases, or 6·5 per cent. of the total. Its population is estimated at 27,665, which gives a proportion of 9·2 per 1,000 inhabitants.

The Market-street sub-district is the smallest in point of population, but the Registration returns of mortality are always very high, in consequence of the two large hospitals, the Manchester Infirmary and the Township Hospital, being situated within it. It will be necessary, therefore, in calculating the mortality from infectious diseases in this sub-district, to separate the deaths which have occurred in these hospitals. It is a matter of regret, that for want of hospital statistics and details, the deaths occurring in these hospitals cannot be distributed. Could this be done, it would be found that the rate of mortality from infectious diseases in relation to the total is much higher in Ancoats and St. George's sub-districts than is shown by the figures. From the character of its population, the relative rate of mortality in the Market-street sub-district is small.

The subjoined table exhibits the population of each Registration sub-district within the city,—the aggregate number of deaths from small-pox, scarlet fever, measles, and fever in each sub-district,—the proportion of these deaths in each sub-district to the total number from the same diseases occurring within the city in the years 1868, 1869, and 1870, calculated in per centage,—and the number of deaths from these diseases per 1,000 of the population in each sub-district:—

1868, 1869, and 1870

Registration Sub-District.	Population.	Aggregate number of Deaths from Small-Pox, Scarlet Fever, Measles, and Fever.	Proportion per cent. of Deaths from Small-Pox, Scarlet Fever, Measles, and Fever to the total number of Deaths from these diseases occurring within the city.	Number of Deaths from Small-Pox, Scarlet Fever, Measles, and Fever per 1000 of the Population.
Ancoats	56,276	644	16·7	11·4
St. George's	53,776	719	18·3	13·3
Hulme	81,369	730	18·6	8·9
Chorlton-on-Medlock	51,518	384	9·8	7·4
Ardwick	27,672	258	6·5	9·3
London-road	27,665	256	6·5	9·3
Deansgate	28,153	311	7·9	11·4
Market-street	22,806	610	15·5	26·7

It has been shown that the average annual number of deaths from small-pox, scarlet fever, and typhus fever in each of the ten years, 1851-60, was 1,076, and in the seven years, 1861-7, 973, or the average annual mortality from these three diseases in the city of Manchester during the whole seventeen years was 1,032.

The year 1868, in the latter half of which the Health Committee commenced its duties, was distinguished for the very high mortality from certain zymotic diseases and from diarrhœa in Manchester; the deaths from small-pox, fever, and scarlet fever were in that year 1801.

The following table exhibits the deaths from each of these diseases in the years 1868-9 and 1870:—

Year.	Small-pox.	Scarlet fever.	Fever.	Total.
1868	12	1,117	672	1,801
1869	59	480	357	896
1870	40	236	374	603

The very considerable reduction in the total mortality from these infectious diseases exhibited by this Table in the years 1869 and 1870, if fairly attributable to the exertions of the Heath Committee and its officers, affords the greatest possible encouragement to a continuance and extension of those efforts; and seeing that a reduction has taken place in all three forms of zymotic disease, it is perhaps not too much to say that the diminution is largely due to those efforts. Small-pox in 1868 was fatal in 12 cases. In 1869 the disease had made such headway, that 59 deaths occurred from it. This number has been reduced during the present year to 40. Though the diminution is small, yet so frightfully infectious is small-pox, and so difficult to eradicate and destroy the poison which propagates it, that to have confined it to the limit it had attained in so short a period is something to have achieved, whilst the reduction that has evidently been accomplished gives hope that, with the more thorough requirement of vaccination and the use of additional means for disinfecting bedding and clothing, together with a more prompt removal of the cases as they occur, so as to secure isolation, the disease may finally disappear from amongst us.

Not less gratifying is the diminution of mortality from scarlet fever, and from the various forms of what is popularly termed typhus fever. Whilst from scarlet fever in 1868 there were 1,117 deaths, in 1869 these were reduced to 480, and in 1870 to 236. That there should have been scarcely any increase in the mortality from typhus fever (under which I include the various forms of what is called "fever") under the great accession of cases which has characterised the present year, is very remarkable. In the year 1868 the deaths from fever were 672, in 1869 they were reduced to 357, and in 1870 the deaths were 374; yet in 1869 the number of cases of fever coming under treatment in the Pauper, Charitable, and Public Institutions of Manchester and in the Poor-law Districts was only 2,215, whilst in 1870 the number coming under similar treatment was 4,368.

I refrain at present from entering into a discussion of the causes of the large increase of cases of fever in Manchester during the present year. No doubt it is connected with the large increase of fever cases in Liverpool, and is due in a considerable degree to immigration. A careful record of the circumstances of the cases coming under the treatment of the public medical officers, including notices of the places from which the patients last came and the length of time they have been in Manchester, with a tabulation of results of treatment, &c., would be of very great value, and if extended to all cases where death occurred from whatever disease, would not only enable the Officer of Health to give the death-rate of the city with exactness, or nearly so, but would give much greater precision to some of the statistics which it is his duty to lay before you.

As having an important bearing on the provision which should be made for cases of infectious disease, I have tabulated the ages at which death has taken place during the last three years within the city of Manchester from four of the chief infectious diseases.

Deaths at different ages from four infectious diseases:—

	Small-pox.	Scarlet Fever.	Typhus.	Measles.	Total.
Five years and under	54	1,406	307	541	2,308
Between 5 and 10 years	11	316	143	23	493
Between 10 and 15 years	9	60	131	1	201
Fifteen years and over	37	51	822	0	910
General total					3,912

It will be seen from this table that nearly two-thirds of the deaths took place in children five years of age and under.

Deaths per cent. in childhood:—

	Five years and under.	Under ten years.
Small-pox	48·6	58·5
Scarlet Fever	76·8	93·9
Measles	97·3	99·6
Fever	21·8	32·0

As the whole of these diseases, with one exception, are, as far as we at present know, propagated only by infection, and even in the case of that exception (fever) the disease once formed spreads also by infection, it is obvious that the first and most important object to be sought is isolation of the sick or infected person. As already explained, this cannot be effected in families, except in houses of a good class. In cottage-houses isolation is impossible; hence the diseases not only spread amongst the members of a family or household, but, from the kindly habit which the poor have of visiting each other in a time of sickness, they are also disseminated throughout a considerable community. A large number of cottages also are let off in separate rooms to distinct families, between which, however, an active communication exists. Isolation can only be be effected, therefore, by removal of the patient, and this of course means removal to a hospital.

At a very early period after my appointment as Officer of Health, I waited on the Board of Guardians of the Poor, and requested that they would instruct their medical and relieving officers, in all cases if practicable, when they met with cases of infectious febrile disease amongst the pauper population, to obtain their removal as early as possible to the Workhouse Hospital. I have reason to believe that this has been acted upon to a very great extent, and the result has been, from the early removal of cases to hospital, where they are placed under favourable circumstances in regard to ventilation, cleanliness, diet, &c., and wherein the medical treatment prescribed is more strictly carried out than it could be in their own homes, that a very much increased proportion of recoveries to cases has been effected, redounding to the credit of the hospital arrangements, and testifying to the skill of the very able officers by whom they have been effected. It is fortunate that, from the powers possessed by Poor Law Guardians, hospital accommodation is capable of expansion to any extent that the exigencies of the extreme poor may require.

From the obstinacy or reluctance of the friends of persons suffering from febrile infectious disease, it often happens that the medical officers are unable to effect the removal of the latter to a hospital, and they remain in their own confined dwellings throughout the course of their disease, thereby not only prejudicing their own recovery, but exposing to constant danger the other inmates of the house and the neighbouring inhabitants. In these cases the Sanitary Act of 1866, by clause 26, enables the medical officer, if he is of opinion that the patients have not proper lodging or accommodation, to obtain a Magisirate's order for their removal to a hospital. Now, as it very rarely happens that in the cottages of the class who seek for pauper or charitable relief there is sufficient or proper accommodation in respect to cubical space, ventilation, &c. for persons suffering from febrile infectious diseases, it would be well if this power were as often as necessary put into operation; but as the medical officers for the most part are perhaps naturally reluctant to increase their duties and occupy their time by seeking out for a Magistrate's order, it would not be unreasonable that a small fee, in addition to their ordinary remuneration, should be paid for the trouble they might take in this matter. It would probably be sufficient for the medical officer to write out a certificate merely in accordance with the terms of the Act, whilst it should be the duty of another official to obtain the Magistrate's order.

In furtherance of this object, the Disinfecting Officers of the Health Committee and the Sanitary Inspectors of the Nuisance Committee have been furnished with recommendations to the Manchester Infirmary, and have been instructed, in all cases where they may meet with cases of febrile infectious disease, to endeavour to effect their removal to that hospital; and they have been directed to take all necessary steps to facilitate the removal by obtaining the necessary certificate as to the nature of the disease from the medical attendant,—to take the recommendation to the hospital, and to assist in the removal of the patient. A large number of cases have been sent to the Infirmary during the present year by this means. The importance of extending the existing hospital accommodation for this class of disease was urged by me in my first Report, as already detailed in the early portion of this one, and several public meetings were held, at which I pleaded for the foundation of a fever hospital, believing that it was inexpedient that such cases should be admitted into a general hospital. It is gratifying to know that the Board of the Royal Infirmary, aided by the munificence of Mr. Barnes, are taking steps for the erection of a fever hospital to contain not less than 80 beds, and I trust that not only will every facility be afforded for the carrying out of this design, but that all the support and assistance which can be given to it will be accorded by the Corporation.

It was shown, in my first Report, that out of a total of 10,928 deaths from five infectious diseases, during the ten years of 1851-60, not less than 7,278 occurred in children under five years of age; whilst in the three years 1868-69-70, out of a total of 3,912 deaths from four febrile infectious diseases, 2,308 occurred in children aged five years and under. In round numbers two-thirds of the deaths from these infectious diseases occur in children under five years of age. Now, as only 21 deaths from small-pox during the seven years 1861-67 occurred in the Manchester Infirmary, and 16 in the Manchester Township Hospital, and only 16 deaths from scarlet fever occurred in the Manchester Infirmary during the same period, and six deaths in the Manchester Township Hospital, it is evident that children suffering from these diseases have not hitherto found their treatment in these institutions, or been isolated by removal to them; and as there are only five beds appropriated to this class of cases in the hospital for children, they may be considered at present to be totally unprovided for. I am glad to be able to announce that land has been purchased at Pendlebury for a large children's hospital, and it is to be hoped that no very long time will elapse before the completion of the latter. Thus we may probably have two great and urgently-required public hospitals erected ere long, in addition to those existing when these investigations were commenced. I am of opinion, however, that so far as the infectious diseases of children are concerned, the Children's Hospital at Pendlebury will be valuable as a convalescent hospital, rather than for the immediate treatment of the diseases.

It has been shown in this Report that the largest proportion of the cases occur in the eastern districts of Manchester, and the next in the western; and I am of opinion that a cottage hospital established on the eastern side of the city, and another on the western, exclusively appropriated to children suffering from febrile infectious diseases, would meet a great want not likely to be met in an equal degree by any other arrangements.

By laying two houses together, securing efficient ventilation for the rooms, and furnishing them simply, all the requirements of such an institution could be obtained at a very trifling expense. Suitable medical attendance and nursing could be had without difficulty. The poor would have less dread of such an institution than of a fine or large hospital, and any mother could take her suffering child wrapped in a blanket the moment the nature of its disease was discovered, without undergoing the intolerable loss of time and waste of labour incurred in seeking for a recommendation. If after recovery from the first symptoms of small-pox or scarlet fever, the children could be drafted to the Pendlebury Hospital for the completion of their recovery, and be retained there till the danger of infection from their persons had passed away, very much would be done towards stamping out infectious disease in Manchester.

Next in value to isolation is disinfection. This of course can be more effectually accomplished when the patient has been removed than whilst he is still in the house to be disinfected. For the purpose of disinfection the city is divided into four districts, to each of which a disinfecting inspector is appointed, and whose duty it is to visit and disinfect any house in which a death has occurred from infectious disease, so soon as a report thereof has been obtained from the registrar's returns, and also to visit and disinfect the premises wherein any case of infectious disease may be ascertained to be present, the information respecting these being derived from the reports supplied by the clerks to the boards of guardians, by the medical officers of public medical institutions, by private medical practitioners, by the sanitary inspectors of the Nuisance Committee, and by others. The disinfectors generate chlorine freely within the houses from which the patients have been removed, and in such quantities as the patient will bear when he may happen to be still in the house. Liquid carbolic acid and carbolic acid powder are also freely employed. In some few instances, when the bedding seemed to be in such a state that disinfection of it was impossible, it has been destroyed by burning. In addition to the staff of disinfectors, a number of whitewashers have for some time been employed by the Committee to thoroughly cleanse and whitewash the houses in which certain infectious diseases have occurred. In the course of their operations they have removed from the walls coatings of paper varying from three to eleven or twelve in number. They first dress the walls and wood-work with a solution of caustic soda, which destroys everything of an organic nature with which it may come into contact; they then apply to the walls the necessary coatings of whitewash.

I hope to be able to obtain perchloride of iron in such quantities and at such a price as will make it a valuable addition to our disinfecting agents.

From the bulk and weight of the materials used in disinfection, and the great distances asunder of the houses which have to be disinfected, the disinfectors necessarily lose some time in going backwards and forwards for their materials, and Inspector Whiley has therefore been trying during the last few weeks whether a pony and cart, which would expeditiously convey the materials for disinfection, as well as for whitewashing, could not be advantageously employed. The number of houses disinfected by the inspectors under the Nuisance department from November 9th, 1868, to June 7th, 1869, was 499. The number disinfected by the officers of the Health Committee from June 7th, 1869, to November 9th, 1869, was 520. The number of visits have been 1,842. The number of houses disinfected by the officers of the Health Committee from November 9th to December 31st, 1869, was 230. The number of visits, 1,163. The number of houses disinfected during the year 1870, was 1,636. The number of visits, 8,824.

The number of houses in which fever has occurred within the city from January 1st to October 31st, 1870, so far as known to the officers of the Health Committee, was 1,019. The number in which fever has recurred, 124. The number in which there have been two recurrences of fever, 32. Those in which there have been three recurrences of fever, five; and the number in which there have been four recurrences, one. The number of cases in which the first recurrence occurred under one week was 44, that is, the interval between the first and second cases.

In 21 cases the interval was between one and two weeks; in 19 cases between two and three weeks; in 12 cases between three and four weeks; in 14 cases between one and two months; in four cases between two and three months; in three cases between three and four months; in four cases between four and five months; in one case between five and six months; in one case between six and seven months; and in one case between seven and eight months.

The interval between the first and second recurrences was in 11 cases under one week; in 10 cases between one and two weeks; in five cases between two and three weeks: in two cases between three and four weeks; and in four cases between one and two months.

The interval between the second and third recurrences was in one case under one week; in one case between one and two weeks; in two cases between two and three weeks: and in one case between three and four weeks.

The interval between the third and fourth recurrences was under one week.

In Dublin, Liverpool, and Leicester, and probably in several other considerable towns, arrangements of a very complete character appear to have been made for the disinfection of bedding, clothing, carpets, curtains, and drapery of every description, by means of ovens, the atmosphere of which can be raised to a high temperature. Those ovens appear not only to serve for the disinfection of the bedding and clothing of the poor, but are also largely made use of by the wealthier classes in whose houses infectious diseases have occurred. A furnace is also provided in connection with these in which such articles of bedding, clothing, &c., as are either not worth disinfecting, or are so saturated with infectious matters that complete disinfection of them is difficult or impossibbe, can be burned. Arrangements on the same premises are also made for washing with carbolic acid soap, or with chloride of lime, articles so infected as to render the washing of them inexpedient at home. These contrivances appear to be much valued, and are highly spoken of by the authorities of the cities and towns in which they have been constructed. I have sent Mr. Pape to Liverpool to make accurate drawings and estimates of such arrangements as have been constructed most recently, and with such improvements as experience has suggested in that town; and I have also received from the chairman of the Board of Health at Leicester tracings and descriptions of the apparatus in use in that town. These I have the pleasure to lay before you.

If the efficiency of such apparatus has been satisfactorily tested in these towns, it is certainly desirable that so considerable a city as Manchester, in which to a certain extent infectious disease always prevails, should be provided with them. And I would respectfully suggest the appointment of a sub-committee to consider this and some other matters brought forward in the present Report.

It cannot be too well understood, however, that the removal at frequent intervals of all putrifying matters, the thorough cleansing of all portions of the city, the opening up of closed courts, the more efficient ventilation of crowded localities, the closing as human dwellings of damp mephitic cellars, the giving vent at an altitude above the houses of the gases and vapours eliminated by decomposition in the drains and sewers, are all adjuncts in the great work of stamping out infectious disease in a great city. It would appear that in the human system there are elements in the blood susceptible, under enervating circumstances, of such degradation as, under the influence of the specific poisons which germinate infectious diseases to take on that course of action in which these diseases consist. Where the strong and the healthy can resist, the weak and the feeble succumb.

Deaths from Four Infectious Diseases in the city of Manchester during the Years 1868-69-70.

Year.	Small-pox.	Measles.	Scarlatina.	Fever.	Total.
ANCOATS REGISTRATION DISTRICT.					
1868	1	60	195	74	330
1869	8	60	100	43	211
1870	6	9	33	55	103
	15	129	328	172	644
DEANSGATE REGISTRATION DISTRICT.					
1868	3	16	147	31	197
1869	2	32	34	13	81
1870	8	1	9	15	33
	13	49	190	59	311
LONDON ROAD REGISTRATION DISTRICT.					
1868	2	8	73	69	152
1869	0	16	28	15	59
1870	0	12	10	23	45
	2	36	111	107	256
MARKET STREET REGISTRATION DISTRICT.					
1868	2	7	34	217	260
1869	17	8	40	130	195
1870	5	4	13	133	155
	24	19	87	480	610
ST. GEORGE'S REGISTRATION DISTRICT.					
1868	1	37	211	98	347
1869	19	80	100	71	270
1870	7	4	53	38	102
	27	121	364	207	719
HULME REGISTRATION DISTRICT.					
1868	0	78	248	78	404
1869	10	33	119	33	195
1870	8	5	71	47	131
	18	116	438	158	730
CHORLTON REGISTRATION DISTRICT.					
1868	2	22	134	60	218
1869	0	19	39	32	90
1870	5	4	28	39	76
	7	45	201	131	384
ARDWICK REGISTRATION DISTRICT.					
1868	1	12	75	45	133
1869	3	28	20	20	71
1870	1	10	19	24	54
	5	50	114	89	258
Total...	111	565	1833	1403	3912

Ages at Death from Infectious Diseases during the Years 1868-69-70.

	5 years and under.	Between 5 and 10 years.	Between 10 and 15 years.	Above 15 years.
ANCOATS REGISTRATION DISTRICT.				
Small-pox	6	1	0	8
Measles	128	1	0	0
Scarlatina	272	42	10	4
Fever	42	26	12	92
	448	70	22	104
DEANSGATE REGISTRATION DISTRICT.				
Small-pox	6	4	0	3
Measles	46	2	1	0
Scarlatina	128	45	8	9
Fever	10	8	6	35
	190	59	15	45
LONDON ROAD REGISTRATION DISTRICT.				
Small-pox	0	0	1	1
Measles	36	0	0	0
Scarlatina	88	18	5	0
Fever	12	16	5	74
	136	34	11	75
MARKET STREET REGISTRATION DISTRICT.				
Small-pox	5	1	3	15
Measles	16	3	0	0
Scarlatina	65	17	2	3
Fever	84	42	68	286
	170	63	73	304
ST. GEORGE'S REGISTRATION DISTRICT.				
Small-pox	21	2	3	1
Measles	114	7	0	0
Scarlatina	272	72	10	10
Fever	63	15	16	113
	470	96	29	124
HULME REGISTRATION DISTRICT.				
Small-pox	8	2	2	6
Measles	110	6	0	0
Scarlatina	346	61	14	17
Fever	39	18	10	91
	503	87	26	114
CHORLTON REGISTRATION DISTRICT.				
Small-pox	5	1	0	1
Measles	44	1	0	0
Scarlatina	150	36	7	8
Fever	32	16	8	75
	231	54	15	84
ARDWICK REGISTRATION DISTRICT.				
Small-pox	3	0	0	2
Measles	48	2	0	0
Scarlatina	84	23	3	4
Fever	25	5	7	52
	160	30	10	58
Total	**2308**	**493**	**201**	**910**

Deaths from Febrile Infectious Diseases within the city of Manchester, during the years 1868, 1869, *and* 1870.

SMALL-POX.

Total number of Deaths.

1868	12
1839	59
1870	40
Total Deaths	111

Registration Sub-Districts within which the Deaths have occurred, and the number in each Sub-District.

Ancoats	15
St. George's	27
Hulme	18
Chorlton-on-Medlock	7
Ardwick	5
London-road	2
Deansgate	13
Market-street	24

Ages at which the Deaths occurred.

5 years of age and under	54
Between 5 years and 10 years	11
Between 10 years and 15 years	9
15 years and upwards	37

SCARLET FEVER.

Total number of Deaths.

1868	1117
1869	480
1870	236
Total Deaths	1,833

Registration Sub-Districts within which the Deaths have occurred, and the number in each Sub-District.

Ancoats	328
St. George's	364
Hulme	438
Chorlton-on-Medlock	201
Ardwick	114
London-road	111
Deansgate	190
Market-street	87

Ages at which the Deaths occurred.

5 years of age and under	1406
Between 5 years and 10 years	316
Between 10 years and 15 years	60
15 years and upwards	51

FEVER.

Total number of Deaths.

1868	672
1869	357
1870	374
Total Deaths	1,403

Registration Sub-Districts within which the Deaths have occurred, and the number in each Sub-Division.

Ancoats	172
St. George's	207
Hulme	158
Chorlton-on-Medlock	131
Ardwick	89
London-road	107
Deansgate	59
Market-street	480

Ages at which the Deaths occurred.

5 years of age and under	307
Between 5 years and 10 years	143
Between 10 years and 15 years	131
15 years and upwards	822

MEASLES.

Total number of Deaths.

1868	240
1869	276
1870	49
Total Deaths	565

Registration Sub-Districts within which the Deaths have occurred, and the number in each Sub-District.

Ancoats	129
St. George's	121
Hulme	116
Chorlton-on-Medlock	45
Ardwick	50
London-road	36
Deansgate	49
Market-street	19

Ages at which the Deaths occurred.

5 years and under	542
Between 5 years and 10 years	22
Between 10 years and 15 years	1
15 years and upwards	0

REPORT OF THE OFFICER OF HEALTH.

To the Chairman and Members of the Health Committee.

Gentlemen,—I purpose in the present Report to give a brief statement of the progress of sanitary improvement in Manchester since the formation of the Health Committee and the appointment of an Officer of Health,—to indicate the directions in which this must be further extended,—to detail the operations by which epidemic and endemic diseases have been met, their progress to some extent arrested, and their effects mitigated; and, finally, in a series of tables, to exhibit the mortality in Manchester during the four years of the Committee's existence.

In recording the improvements which have been effected or are in course of accomplishment, I am earnestly desirous to do full justice to public bodies and to private individuals, both within and without the Council, to whose far-sighted policy, benevolence of intention, and munificent generosity, some of the improvements are due to which I shall have to call attention. Some of these have been carried out by other Committees of the City Council, with which, however, the Health Committee is in necessary relation; others by the governing bodies of our great charitable institutions, aided by munificent contributions, the good accomplished by which will leave an undying fragrance around the names of the benevolent donors.

The Health Committee *can* only do a considerable portion of its work suggestively, and it is to the hearty co-operation of its associated bodies within the Council, and to the concurrent enterprise of benevolent associations and of private individuals without, that the great object of its formation can be fully carried out. In the narration, therefore, of its own operations, and in the notices of the great works which have sprung up during its existence and which have been stimulated by its proceedings, I am anxious to deprecate any assumption that the Committee or the Officer of Health claims anything beyond what has properly devolved upon them, and to express the obligations of the Committee to other Committees of the Council and to Boards of Guardians of the Poor, as well as to the governing bodies of our charitable and other public institutions.

The Health Committee was constituted April 1st, 1868, the Officer of Health having been appointed the 4th of March previously.

The Officer of Health deemed it to be his first duty to call the attention of the Committee to the excessive mortality from infectious febrile diseases within the city, and to the inadequate amount of hospital accommodation provided for the isolation of the cases. In his first Report, dated March 26th, 1868, he showed that in the ten years from 1851 to 1861, there had died in the Registration District of Manchester, from five infectious febrile diseases alone, 10,945 persons, and in Chorlton Registration District, 5,604—a total of 16,549 persons; that during the subsequent seven years, 1861-7, in the Registration Sub-districts of Ancoats, St. George's, Market-street, London-road, Deansgate, Chorlton-on-Medlock, Hulme township, and Ardwick township, there had died from these diseases 10,443 persons, out of a total mortality of 70,399; that, in fact, nearly one-sixth of our total mortality was due to scarlet fever, the various forms of typhus and typhoid fever, measles, smallpox, and whooping cough—diseases, with perhaps one exception, propagated solely by infection, and hence to a large extent preventible, if not absolutely so.

Assuming 6 as the multiple representing the relation of cases to deaths from these diseases, a total of 166,952 cases within the 17 years was here indicated, or an average of 9,526 cases per annum. It was also shown that considerably more than two-thirds of all the deaths from infectious diseases occurred in children under ten years of age.

Commenting on this mortality, the Officer of Health proceeded to say: "I have long held the belief that the only efficacious mode of arresting the spread of infectious diseases is by isolation of the cases. Disinfectants, as chlorine, carbolic acid, and other bodies acting by decomposition, may do something in purifying an infected atmosphere, but their chief use is in cases where there is no renewal of the infection,—where the patient has been removed and the infection still lingers in the air of the sufferer's apartment,—in the furniture, the bedding, and the apparel, as well as in the voided matters. But when every breath of the patient, every exhalation from his body, whatever indeed passes from him, is a fresh source of infection, it is idle to attempt to stop the spread of it by antiseptics alone. Looking at the general condition of the inhabitants of Manchester, and at the size and arrangements of their dwellings, it is obvious that isolation cannot be effected therein, with the rare exceptions of the large and commodious houses of the wealthier classes, wherein rooms can be shut off from the rest of the building, and the patient can be separated from his family or the latter removed. But taking the houses of the working classes, wherein every room is necessary for the requirements of the families occupying them, it is simply impossible that the sufferer from smallpox, scarlet fever, or typhus fever can be separated from the rest of the occupants. The disease infects one after another, and is conveyed to neighbours and friends, with the frightful results indicated above.

"Isolation of the infected sick, then, means removal to an hospital, and this has led me to make an inquiry into the amount of hospital accommodation in Manchester appropriated to infectious diseases of the type I am now discussing."

The result of the inquiry was, that whilst for pauper patients there was necessarily adequate provision, inasmuch as the accommodation could be expanded at the will of the respective Boards of Guardians, yet for the independent poor the means of isolation were miserably deficient, and for the infectious diseases of children almost *nil*. The Royal Infirmary was the only hospital receiving adult persons, not being paupers, suffering from infectious disease, and the small hospital in Bridge-street the only one receiving young children similarly affected.

The number of beds ordinarily set apart for these cases in the Royal Infirmary was 32, though arrangements could be made by which the accommodation could be increased to 70 beds. In the Children's Hospital the total available number of beds for these cases was 5, and this number admitted of no expansion.

It was shown further that on an average 973 persons had died every year within the city during the preceding seven years from three infectious diseases alone—typhus fever, scarlet fever, and smallpox, of which number only 171 had died in all the public hospitals of the city (including the pauper hospitals), leaving the large annual balance of 802 deaths which must have occurred at the houses of the patients.

Of the deaths occurring in hospitals, 34 took place in the Manchester Infirmary, being equal to about 204 cases. The gravity of these numbers, however, can only be realized by calling attention to the fact that the large number of 973 represents the *deaths* only which had taken place each year from the three infectious diseases. The number of persons ill of these diseases, or the number of cases which these figures represent, is about 6,000 annually, or during the seven years (1861-7) the enormous aggregate of 42,000 persons who have suffered more or less from typhus fever, scarlet fever or smallpox.

It thus became evident that neither the pauper hospitals nor the hospitals supported by charitable contributions and bequests were properly made use of for the isolation of cases of infectious disease,—that neither the public nor the faculty availed themselves to the full extent of the accommodation already provided in the hospitals; whilst if proper efforts were made for the removal of the infected sick, it was seen that the existing accommodation was totally inadequate, especially for the reception of children, five beds alone being the total number provided for their cases throughout the whole of the city, except in the pauper hospitals; and it was shown that into the latter children suffering from infectious diseases were scarcely ever admitted. It is not meant that they were designedly excluded, As it was the intention of the Officer of Health to obtain the separation of persons suffering from infectious disease from the rest of their families, by obtaining their removal to hospital wherever practicable, the gravity of the circumstances induced him to urge the Chairman of the Health Committee, at that time Mayor of the city, to call a public meeting to consider the desirableness of extending the hospital accommodation for such cases. The meeting was held in the Town Hall, July 30th, 1868, under the presidency of the Mayor, Robert Neill, Esq. At this meeting a Committee was appointed "to inquire into the amount of hospital accommodation for febrile infectious diseases in Manchester." On the Committee were the Mayor, Messrs. O. Heywood, Brown, Pooley, Steinthall (Chairman of the Committee of the Children's Dispensary), Birch, Bremner, and Heron, and Drs. Noble, Borchardt, Reed, Radford, and the Officer of Health. The Committee held several meetings, and made careful inquiries, and finally presented a Report to the general meeting subsequently held in the Town Hall, of which the following is a summary:—

1. The Committee consider that ample provision exists in the workhouse hospitals for the reception of all pauper cases of febrile infectious disease.

2. The Royal Infirmary being the only hospital for infectious cases among the independent poor, the accommodation for this class seems inadequate.

3. For the children of the independent poor suffering from these infectious diseases, there is practically no hospital accommodation whatever. On the ground both of economy and humanity the Committee feel it their duty to put in a claim for some hospital provision for this class.

4. Such hospital provision would be beneficial,—(1) in securing the recovery of many more cases than if treated at the homes of the patients, and (2) in checking the spread of infection among the families of the poor.

The Committee consider that the heavy death rate in the city is largly due to the mortality from infectious diseases among young children, and can best be modified by hospital provision being made for children, and more ample accommodation for adults of the independent poor.

5. Speaking generally, the Committee consider that should an epidemic of a febrile infectious character occur in this city, adequate hospital capacity does not at present exist to meet such an emergency.

The Report of the Committee was adopted by the meeting.

Subsequently the Officer of Health waited on the respective Boards of Guardians of the Poor acting within the city, and on the Boards and Committees forming the governing bodies of the Charitable Medical Institutions, to request that they would urge upon their medical officers the importance of isolating cases of infectious disease coming under their treatment by sending such cases at once to hospital. He also furnished the officers of his own department with "Recommendations," to be filled up as cases were discovered suitable for the Infirmary. This portion of the arrangement of his department will be more fully described hereafter. The Boards of Guardians at once took measures for the reception of a larger number of cases, and the Board of the Manchester Royal Infirmary, in the most earnest and laudable manner, made strenuous efforts to meet the calls made upon them, and with a liberality of feeling and action which requires the most ample acknowledgement. Indeed the Officer of Health is glad of this opportunity of expressing his conviction that had it not been for the hearty coöperation and sympathy of the Board of the Infirmary and its Officers, it would have been impossible to have arrested the progress of smallpox within the city, and to have confined it within the narrow limits which have marked its career amongst us.

The strain, however, upon the accommodations of the Institution, and the inconvenience of having so large a number of such cases within its walls, led the Board to consider the desirability of having a distinct hospital for these diseases, and in such a situation that due time could be given to convalescence, the full period for which is as important as isolation in the earlier stages. Fortunately the munificence of the late Mr. Barnes, who placed at the service of the Board a very large sum in furtherance of their object, has enabled the Board to erect at Monsall, near Harpurhey, the fine building now near its completion, and has made it possible to remove from the Infirmary the cases of infectious disease, and leave it free for its more legitimate objects.

From information kindly furnished by Dr. Reed, the Officer of Health is in a position to state that the new Fever Hospital is already open for the reception of cases of infectious diseases with 64 beds,—that when completed it will contain 128 beds, the whole of which will be appropriated to infection cases only,—that in two months from this date (January 15th) the main building will be completed, and that at the present time 32 beds in a temporary building are appropriated to convalescents from smallpox.

Concurrently with this great Institution, has been quietly and silently rising on the opposite verge of the city a building or buildings not inferior in magnitude, in noble porportions, or in benevolence of object,—the new Children's Hospital at Pendlebury, admirably planned, and situated on elevated ground in a most beautiful and healthy locality. This fine hospital, whilst an ornament to its neighbourhood, will realize one of the greatest desiderata of our city. It has been carried out with an amplitude of proportions, and on an extent of area, that must secure the best chances for recovery to the poor little creatures who will become its inmates.

No nobler work in the service of the Divine Master who said—"Suffer little children to come unto me," can be devised than this. As there is nothing more painful to a sensitive mind than suffering childhood, so nothing can be more gratifying than an inspection of this light, airy, and cheerful abode, devoted to the amelioration of that suffering. It will consist, when complete, of six pavilions, and will contain 160 beds, together with administrative buildings. Three of these pavilions, with 82 beds, are nearly completed, and will very shortly be open for the reception of patients. 25 beds will be devoted to the reception of cases of infectious febrile disease.

Thus it will be seen that these two new hospitals will contain, when finished, 288 beds; that 153 beds will be devoted exclusively to the reception of cases of infectious disease, and that 160 beds will now be provided for poor sick children, who hitherto have scarcely had any such provision at all.

Within the period covered by this Report the Hulme Dispensary has also been founded, and is a source of extensive and valuable assistance to the large population of that township.

A commodious building has been erected in Trafford-street, adjoining the Hulme Town Hall, for the purposes of this institution.

For the erection of a hospital in connection with the Ardwick and Ancoats Dispensary, a sum of £5,000. has been given by a benevolent lady in Brighton, and land has been purchased for a site. The designs for the building are very handsome and elegant, and it will be commenced forthwith.

This perhaps will be the proper place to relate the proceedings of the Health Committee in its efforts to check the spread of infectious diseases within the city. Of the success of those efforts some remarks will be made in the history of the smallpox epidemic with which the city has been visited during the past year.

To the removal of accumulations of decomposing and effete matters at short intervals the attention of the Committee has been constantly directed, and in all the reconstructions of ashpits and privies (the chief receptacles of these matters) which have been required by the Committee, this has been steadily kept in view. As these conveniences are ordinarily used by all the inhabitants of a house, and in many localities one privy and ashpit only is provided for the occupants of several houses, it is obvious that the discharges from an infected person thrown into a receptacle so used may be the means of spreading the infection to a considerable extent, and especially is the danger of this extension increased when the liquid contents are allowed to flow into the neighbouring drains and sewers, as is the case with all the old privies and ashpits. Hence the new and reconstructed privies are made with impervious floors, consisting of thick well burnt earthenware dishes or pans, with three of the sides considerably raised, set in cement, and inclined from the door of communication; they are quite impervious to moisture, and effectually exclude any communication with the neighbouring drains, or any saturation of the subjacent or adjacent soil with excretal matter. The importance of a speedy removal of the contents of these receptacles in localities in which infectious disease exists cannot be over estimated, but as the daily removal would under existing arrangements be a matter of considerable difficulty, it has been made an essential duty of the disinfecting officers of the Health Committee to put into all drains, ashpits, and privies connected with the infected houses they visit a quantity of some powerful disinfectant, and to repeat this on every occasion of their visits.

For a considerable time the Committee has had a permanent staff of four disinfectors, two of whom were appointed June 4th, 1869, and two on May 30th, 1870. During about three months in the year two supernumerary disinfectors have also been engaged. The following is a copy of the Instructions read over to the disinfectors by the Officer of Health, and written at the beginning of each disinfector's report book:—

Duties of the Disinfectors.

From April 1st to October 1st, the disinfectors are to be at the Office in York Chambers at eight o'clock in the morning, and each disinfector shall write up in his report book the work he may have done on the previous day.

The hours of duty during the summer months, viz., from April 1st to October 1st, shall be from eight in the morning until six o'clock in the evening, with an interval of one hour and a half for dinner. From October 1st to April 1st, the disinfectors are to be at the Office, York Chambers, at nine o'clock in the morning. Each disinfector shall write up in his book the work done at the termination of each day. The hours of duty during the winter months, viz., from October 1st to April 1st, shall be from nine in the morning till five o'clock in the evening, with an interval of one hour and a half for dinner.

Each disinfector shall, on receiving a list of fresh cases of infectious disease which have occurred within his district, endeavour, as far as practicable, to visit and disinfect the houses in which the cases have occurred on the day in which he may receive the list. Should any disinfector find, on visiting an infected house, any person or persons suffering from infectious disease within the house, he shall endeavour to induce the patient or patients to consent to be removed to a public hospital; and shall also endeavour to influence the friends of the person or persons affected to consent to the removal, and shall assist in such removal by obtaining the necessary documents to secure admission into a public hospital, or take such other steps as may be necessary. Should any disinfector at any time discover that members of more than one family are residing in the room in which a person suffering from infectious disease is living, he shall immediately report this to the Officer of Health, as under such circumstances the Officer of Health can obtain the removal of the affected person.

Each disinfector shall, on visiting a house in which infectious disease may exist, inquire the name and residence of the owner of the house, or of the agent acting for the owner, and shall report the result of his inquiries to the Officer of Health daily.

Each disinfector, on first visiting an infected house, shall endeavour to inform himself as to the origin of the disease, that is, whether apparently acquired by infection from some other person, or from the existence of some nuisance in or about the house, or from overcrowding, &c.

Each disinfector, on first visiting an infected house, shall ascertain and record the following particulars respecting it:—Whether it is a "back-to-back" house, or what is called a "through" house; the number and size of the rooms in the house; whether it is a registered lodging house; how many families occupy the house, and the total number of persons of all ages living in the house; whether the house is dirty or clean, well or ill ventilated; whether there is any smell from drains in or about the house; what is the condition of the yard and privy; and generally to note any circumstance that may apparently cause the house to be unhealthy.

The disinfector, on first visiting a house for the purpose of disinfecting, shall commence by thoroughly filling every room in the house with chlorine gas, excepting that in which the sick person may be lying. He shall close the doors and windows of each room, and if practicable, close up the lower part of the chimney or fire-place, so as to confine the gas within the room. It is important that, in order as far as practicable to saturate or charge with chlorine any bedding or clothing that may be within any room, he should allow the gas to fill the room for an hour and a half or two hours. In the room occupied by the sick person he must generate a smaller quantity of chlorine, as it is necessary that he should avoid creating irritation of the chest or lungs of the patient by too strong chlorine. In many cases it will be desirable that he should heat a little carbolic acid in the room occupied by the patient instead of liberating chlorine.

He shall also sprinkle carbolic acid powder on the stairs and on the floors of the rooms, and in the lobbies or passages. He shall also sprinkle the yards, where such exist, at the back of the houses, and the privies and ashpits, either with carbolic acid powder or with a solution of carbolic acid; which solution shall be prepared by stirring well up two ounces of carbolic acid in one gallon of water. In using carbolic acid in rooms or in any portion of a house, he must take care to fill up any crevices with the powder.

He must also leave a little carbolic acid powder with the occupier of the house, and direct him or her how to use it. He must direct that all chamber utensils used by the patient be charged with carbolic powder. If the patient should die, carbolic acid powder must be sprinkled freely over the corpse. If there are any openings to drains within the house, or in the yard or passage connected with the house, he shall pour a quantity of carbolic acid down the openings or grids.

The disinfector shall also strongly urge the occupiers of a house in which any infectious disease exists to drink only such water as is supplied by the city authorities, and not to drink any of this if it has been standing in the house for a little time, but always to obtain it from the tap for drinking purposes and for cooking.

He shall also take all necessary trouble to dissuade the occupants of the house from visiting a sick person, or from entering the sick person's room, and he shall call at the neighbouring houses and similarly dissuade the occupiers thereof from visiting the infected house. He shall also urge upon the friends of the sick person who may be dwelling in the same room or house, or be in attendance on the sick person, not to allow friends or relations from a distance to enter the room where the sick person lies.

A number of whitewashers, varying from seven to fourteen, have also for a considerable time past been engaged by the Committee, whose chief duty it is to visit and clean the houses which have already been disinfected. Their instructions are—

1. To strip the paper from all the walls of the houses they visit, and to take it in a covered van to the furnace erected in the Committee's yard in New Allen-street, and there to burn it. The furnace is a closed one.

2. To scour the walls, ceilings, and woodwork of the houses with a solution of caustic soda (strength, two ounces to one gallon of water).

At the request of the owner or occupier the walls and ceilings may be coloured or limewashed at their own cost. The cost in all cases to be prepaid.

The number of houses disinfected by the disinfecting officers since the commencement of their duties, June 4th, 1869, is 5,027; the total number of visits made, 19,875.

The number of houses disinfected during the year 1871 is 2,621; the total number of visits made during the year, 8,046.

The number of houses cleaned, or cleaned and whitewashed, since the appointment of the whitewashers on June 23rd, 1871, to January 23rd, 1872, (six months) is 631. These houses contained 2,234 rooms.

In the first Report of the Officer of Health, dated March 26th, 1868, he advised the disinfection of clothing and bedding by the application of a high temperature, and the destruction, by burning, of such clothing, bedding, &c., as might be soaked by infectious discharges.

In his second Report, presented to the Health Committee, November 22nd, 1869, he advised that suitable disinfecting ovens or stoves should be constructed in one of the yards belonging to the Corporation.

Again, in his Report to the Health Committee, of December 19th, 1870, the Officer of Health urged the construction of a disinfecting oven, showing that in Liverpool, Leicester, Dublin, &c., such ovens had been constructed with very beneficial effects, and that they had been used not only for the disinfection of the bedding and clothing of the poor, but had been largely made use of by the wealthier classes in whose houses infectious diseases had occurred.

The necessity for such an oven or stove became very pressing on the outbreak of smallpox during the last year, and the Committee took considerable pains to ascertain what forms of construction had been adopted in other towns.

It appeared to the Committee that an oven could be constructed possessing some advantages over any of those brought under their notice, and it was resolved to erect one on a piece of vacant land belonging to the Corporation, near New Allen-street. The oven was used for the first time on the 28th of October, 1871. It is of sufficient size to contain several beds on open frame-work benches, as well as a large quantity of blankets, sheets, clothing, &c., suspended from rods running across the oven, and has hitherto been found amply sufficient for the wants of the city.

A temperature of 300 deg. Fahr. can be readily and rapidly produced within the oven. A temperature of 250 deg., however, is that to which articles sent are ordinarily subjected. They are retained within the oven for several hours, and are exposed to a current of chlorine during the time they are being stoved.

So effectually is the disinfection of the articles stoved accomplished, that the bedding of smallpox and scarlet fever patients has been frequently slept in immediately after the stoving without any injurious results. Indeed, after careful inquiry, the Officer of Health has been unable to discover any cases of fresh infection arising from the use of bedding or clothing that has passed through the oven.

From October 28th, 1871, to January 19th, 1872, 2,086 articles removed from 193 houses have been disinfected in the ovens, viz. :—158 blankets, 143 sheets, 323 pillows, 140 bolsters, 193 quilts, 236 mattresses, 227 beds, 191 carpets, 229 articles of clothing, and 246 sundries.

The temperature of the oven can be regulated with the greatest ease and nicety, and it has altogether equalled the highest anticipations formed of its utility. There is not the slightest smell or nuisance escaping from it. The articles brought to the oven are conveyed to it in a van almost air-tight, and a well closed receiving house is provided for them should the oven happen to be engaged on their arrival.

At the back of the oven is built a capacious stove, the floor of which is formed by the upper part of a furnace. In this stove bedding and other articles which it is thought desirable to destroy are burned, as well as the paper which has been stripped off the walls of infected houses by the whitewashers. There is one remarkable circumstance in connection with the duties of these men which is well worth recording. It has already been stated that they visit infected houses after the disinfectors have left them and strip off the paper from the walls, subsequently wash the walls with solution of caustic soda, and clean the paint, &c. therewith. They state that the number of coats of paper that they find covering the walls of cottage houses varies from three coats to fifteen coats, the latter being the maximum number found, and that the paper has usually a disagreeable, fusty smell; and it is remarkable that these men have nearly all had fever or other infectious disease, contracted in the performance of their duty, although the houses previous to their visits had already been disinfected by chlorine carbolic acid, &c. It would seem therefore that the absorbent power of the paper covering the walls is such as to enable it to retain the germs of infection, if such there be, or, at all events, the infectious matters, and to protect them to a considerable degree from the action of the disinfectants, so that on the paper being removed and torn up, these become liberated and infect the men. On the other hand, it is a very rare occurrence for an infectious disease to break out again in a house which has been fully treated by the disinfecting officers and whitewashers. Until the plan was adopted of stripping off the paper and dressing the walls and painted surfaces with caustic soda, the recurrence of the diseases was not unfrequent. This shows the necessity, even in the better class of houses, after the occurrence of infectious disease, of not being satisfied with mere cleaning, whitewashing, and repainting, but for the removal of all paper from the walls, and the washing of these with some powerful corrosive that may destroy all injurious organic matter.

Another thought is suggested by the apparent facts just recorded,—that if wall paper be capable of absorbing so readily infectious matters given off by the human body, it will probably absorb other organic matters given off by the body both in a state of health and when suffering from other than infectious diseases, emanations given off with the breath and with prespiration. These becoming putrid, may after a time render a room unwholesome, and especially may this be the case where there are several coats of paper pasted one over the other; and whether it would not be better, instead of putting on walls expensive papers destined to remain a long time, to put on simple and cheaper papers which can be frequently renewed. Seeing also that bedding, as mattresses, feather beds, flock beds, &c., are so rarely washed or fully exposed to the atmosphere, and that blankets do not undergo very frequent ablutions, would it not be conducive to health that these should be stoved in a current of chlorine or sulphurous acid at least twice a year, as they must be contaminated to a greater or less degree, after six months' usage, with organic matters proceeding from the bodies of those who have slept in them. Perhaps the simplest way of doing this would be to place them in a hot room, and to fill the room with chlorine or burn sulphur in it. It is certainly necessary that all large hospitals, workhouses, and perhaps other institutions containing a large number of residents, should have suitable appliances for heating and chlorinating or sulphurising the bedding and clothes of the occupants, whether suffering from infectious disease or otherwise. Such a process must render them sweeter and more wholesome.

So complete appear to be now the arrangements of the Health Committee for the treatment of infectious premises, that it becomes a question—seeing that nearly all infectious febrile diseases are propagated through the atmosphere, by clothing, &c., from one infected person to another—whether it would not be possible, by an extension of the provision for immediate isolation of the infected sick, to annihilate, or very very nearly so, these diseases from amongst us. Suppose we had at present no single case of smallpox or of scarlet fever in the city, we should continue free from them until some person affected with one of these diseases came amongst us, or some articles of clothing or other matters containing the infection arrived, soon after which, it is probable that one or more persons would become affected. These would communicate the disease to other members of their families, and to friends visiting them, and so would it spread throughout the community and retain a long foothold amongst us. But if the first cases were promptly removed to a hospital, and the premises from which they were removed, and the bedding, clothing, and articles which they had used were thoroughly disinfected, it is almost certain that no further extension of the infection would take place. For this, however, the concurrence of the inhabitants would be necessary; and as a vast majority of these cases occur in young children, it would be especially necessary to disarm the fears and opposition of the children's mothers.

For such cases as occur in adults it is probable that sufficiently ample accommodation will be provided in the new fever hospital at Monsall, supplementing as it will the large hospitals belonging to the Boards of Guardians of Manchester and Chorlton. It is doubtful, however, whether the twenty-five beds appropriated to the infectious diseases of children in the new hospital at Pendlebury, added to those which will be available in the Monsall fever-wa ds, will be sufficient for their cases. The greatest difficulty will be experienced in persuading the mothers to part with their children for conveyance to so long a distance—a distance which would render inquiries as to the progress of their offspring at frequent intervals impossible, and from whence the first intimation received might possibly be that a child was dead. Less difficulty seems to be felt respecting adults, but a mother clings to her child, and would feel happier were it placed within easy reach of inquiry, and from which she could receive speedy information of its critical condition. Should this be found to be the case, the wards in these hospitals will be not less valuable for the purposes of convalescence when the first acute symptoms have subsided. Hence it may be necessary that small supplementary hospitals or receiving houses should be established at several points within the city, and so conveniently are the present medical institutions placed, that there ought to be no real difficulty in placing such hospitals or receiving houses in connection with them. Looking to the magnitude of the good to be accomplished, to the enormous loss of life that would be prevented, and to the great expenses that would be saved, the cost of such institutions would be the merest trifle, whilst they would crown our medical charities with a completeness which would leave nothing to be desired in the public provision for sickness amongst the poor of the city of Manchester. There seems to be no reason, with such provision, with the appliances possessed by the Corporation, and with the exercise of such moral influence as could be brought to bear upon those amongst whom such diseases chiefly prevail, that infectious disease should not be almost entirely removed from amongst us. It is needless to say that could such be the case, there is enough of suffering in our midst to give full utility to the structures erected.

The number of persons who have died in the city of Manchester from the five infectious febrile diseases (15,417) during the last ten years, estimating our population at the mean of the two numbers determined by the census of 1861 and that of 1871, would amount to 4·47 per thousand inhabitants per annum, the mean population being 344,917.

It would not be possible by the same amount of outlay to effect so large an amount of good as would be accomplished by the purchasing and furnishing with the necessary appliances the small buildings necessary for the purpose here advocated.

The Officer of Health has studied with much interest the Annual Reports kindly furnished to him from the various medical charities in Manchester, and in the Appendix he has given an abstract of the number of patients admitted to attendance, whether as in-patients, home-patients, or out-patients; and the annual income from subscriptions and donations, as declared in the latest Reports, he has been able to obtain of the following institutions:—

Royal Infirmary.
Ardwick and Ancoats Dispensary.
Southern Hospital.
Children's Hospital.
St. Mary's Hospital.
Clinical Hospital.
Chorlton Dispensary.
Hulme Dispensary.
Homœopathic Institution.
Homœopathic Hospital.
Eye Hospital.
Lock Hospital.
Training Institution.

It will be seen that the total number of in-patients, or patients attended within the walls of the respective institutions, in a year was...	3,250
Of home-patients, or patients attended at their own residences	11,511
And of out-patients, or patients who personally attended at the institutions to be prescribed for	65,159
Total	79,920

The total amount of subscriptions and donations for one year to these institutions is £29,651. 11s. 8½d.

The figures above given do not comprehend the entire number of persons receiving gratuitous medical attendance (irrespective of those receiving attendance from the Poor-Law Medical Officers) from the medical charities of Manchester, as there are several small charities from which Reports have not been obtained. Nor does the sum above stated, for the same reason, give the whole amount annually contributed and expended.

Nevertheless a deduction must be made, the amount of which is at present unknown, from the number of *persons* said to have been attended; inasmuch as some of these will have presented themselves with fresh "recommendations" in the course of the year, and will have been entered on the books as fresh cases. Their conversion, also, from one class of cases to another, as from out-patient to home-patient or to in-patient, will have caused a fresh entry to be made, and so the same patient may come to be counted more than once in the course of a year. Still the broad facts, both as to numbers and expenditure, within certain narrow limitations, may be accepted.

Taking the attendance from all sources, there are probably between 80,000 and 90,000 persons receiving charitable medical relief in Manchester every year, at a cost to subscribers and donors of a sum between £30,000. and £40,000. annually.

The Officer of Health is indebted to Mr. Macdonald, Clerk to the Board of Guardians of the Poor of Manchester, for the following Return:—

Township of Manchester.

Return showing the number of sick persons attended by the Medical Officers of the Board of Guardians during the year ended 31st December, 1871:—

Cases attended by the District Medical Officers............	4,601
Cases attended by Workhouse Medical Officers:—	
Workhouse Hospital, New Bridge-street...............	5,961
Crumpsall Workhouse..................................	2,571
Total......................................	13,133

From the Abstract of Accounts published by the Guardians of the Poor of the Chorlton Union, it appears that during the half-year ended Lady-day, 1871, the number of "cases" attended by the Poor-law Medical Officers in such portion of the Union as lies within the city of Manchester (Hulme, Chorlton-on-Medlock, and Ardwick) was	1,722
And during the half-year ended Michaelmas, 1871	2,213
Total..................................	3,935
Grand Total	17,068

The number of persons, therefore, receiving gratuitous medical relief in Manchester annually cannot be much, if any, less than 100,000, or 1 in 3½ of the whole population.

In the face of such figures as these it cannot be said that there is any lack of sympathy for, or interest in, the afflictions of our poorer fellow-citizens by their somewhat richer brethren; and when it is borne in mind that the sum here given, large as it is, is exclusive of the cost of erection of the noble structures from which the attendance is given, and that a very large annual sum is represented in the gratuitous medical services rendered, it becomes a question whether some effort should not also be made by a certain portion of the recipients of relief towards the maintenance of the charities themselves,—whether in fact they should not be to a limited extent self-supporting. Out of the total number of persons receiving assistance, there must be a considerable proportion who can afford to pay some little for what they receive, or to pay a small annual contribution.

A good example has been initiated in this direction by the two homœopathic institutions, whose income has been given in the appendix. In the Homœo-Institution, Lower Byrom-street, 1,978 patients were attended in the year 1868-9 at a cost of £312. 7s., of which amount £129. was contributed by the patients themselves.

In the Homœopathic Hospital and Dispensary, Bloom-street, 2,252 patients were attended during the year 1870, the income of the institution beimg £476. 0s. 6d., of which £204. 8s. 6d. was contributed by the patients.

There is not space in this brief Report to give in detail the means by which this arrangement could be extended to other charities.

Small compensatory contributions would preserve the self-respect of the contributors, would induce them to apply early for assistance, would save the time often fatally lost in hunting for recommendations, and would increase the sphere of usefulness of the institutions.

Of the large sum contributed annually by the benevolent public of Manchester to the maintenance of its medical charities, it is remarkable how very small an amount is devoted to its own protection. Bronchitis, inflammation of the lungs and of other parts, and nineteen-twentieths of the physical ills "that flesh is heir to," are dangerous only to the individual sufferer; there is no fear that their effects will extend to other members of the community. But it is otherwise with smallpox, scarlet fever, diphtheria, measles, and typhus; one case of any of these diseases may destroy many lives. We have seen in the past year what a very few imported cases of smallpox could do. Happily, by the means taken to check its ravages the fatality in Manchester was much less than in most other large towns. But during the ten years between the last census and that of 1861, not less than 15,417 persons have died within the city of Manchester from five infectious febrile diseases, of whom four-fifths were children under ten years of age. And yet during all that time, whilst £30,000. a-year was being expended in the gratuitous treatment of the various ailments of the poor, exclusive of paupers, only five beds in all Manchester were appropriated to the reception of children sick of infectious disease, and to this extent only was isolation effected from the rest of the community. No wonder that so many deaths, representing about 90,000 cases, should have occurred during the decade. The wonder is that society should have been content to be thus ravaged, to have had its homes invaded, its little ones swept away, and sorrow and woe ever present in its households. One-fifth of its contributions devoted to the isolation of these cases would in ten years have almost extinguished them. They spread only by infection, and with the rarest exception in any other way.

What then is the plain course to take? To remove the infected from the uninfected, the sick from the healthy,—to remove them to where they will be well cared for, nursed, and attended, where their chances of recovery will be infinitely greater than in their own wretched homes, and where their power for evil will cease,—to an hospital, in fact. It may be said that beds were provided in the Manchester Infirmary and in the Township Hospital. It was found that in the seven years, 1861-7, only 22 deaths from scarlet fever had taken place in both these hospitals, and several of these were in adults. In the same period 37 died from smallpox in these hospitals, nearly all adults. No deaths from measles are recorded, probably no cases were admitted. During the year ending June 24th, 1870, however, five cases of measles were admitted into the Infirmary. Practically no means were made use of for the isolation of children suffering from infectious disease.

The past year, however, has seen rising into existence a large addition, as already stated in an earlier part of this Report, to our means of isolating these infectious diseases, and very shortly the adult population at least will have ample provision afforded for their reception; but for the cases of children the hospitals will require to be supplemented by small hospitals or receiving-houses in the city.

There is not the slightest danger to the outside public from such small hospitals. They have never been known to produce disease in their neighbourhood. The old fever hospital in Aytoun-street, with about 100 beds, was surrounded by lodging houses, and no infectious disease was ever known to spread from the hospital to these houses. There is no doubt that at Monsall and at Pendlebury as good, perhaps better, accommodation and appliances will be found than would be furnished in local cottage hospitals, and it is desirable that when the early dangerous symptoms have passed away from them, children should be drafted away into these institutions; but it is immensely important that when a child commences with any of the diseases under consideration, its mother should be able to wrap it in a blanket and take it off at once to a neighbouring cottage hospital, at which she may inquire about its progress every day.

This subject has been treated more lengthily than intended, from a conviction of its surpassing importance.

In his Report, presented to the Health Committee, November 22nd, 1869, the Officer of Health recommended "that the city should be divided into districts, not too large, to each of which an inspector should be appointed, whose duty it should be to make a daily inspection of his district,—to report all injurious accumulations of effete matters, whether in cellar areas, ashpits, or waste ground; who should see that streets, courts, passages, &c., were in a proper state of cleanliness,—that no accumulations of foul water from stoppage of street grids, &c., were allowed to continue; who should endeavour to ascertain the occurrence of any infectious disease within his district, and report the facts to the Officer of Health, who should procure the frequent removal of the disinfected excreta, and generally perform such duties as from time to time the Officer of Health should direct; that in his district he should endeavour to arrange for the temporary removal of the healthy occupants of an infected dwelling until it had been thoroughly disinfected, and the bedding and clothes stoved when the patient had been removed."

In accordance with this recommendation, the city was divided into nineteen sanitary districts, to each of which an inspector was appointed. As the Officers connected with the Nuisance Department had hitherto performed the duties that would be required from the new inspectors, it was thought best to place them under the authority of the Nuisance Committee, whose staff of inspecting officers was simply raised to that of the new districts.

The additional inspectors were appointed June 1st, 1870, and the whole body received the following instructions for their guidance:—

Each inspector to make a daily inspection of so much of his district as may be practicable, and in making such inspection carefully to observe—

1. The condition of the ashpits and privies, and to report all such as require to be emptied; to keep an account of the time when each ashpit and privy is emptied after the making of any such report; to inspect such ashpits after they have been emptied; and in case he finds that they have been imperfectly emptied, or that stagnant liquid matter has been left therein, to report the same.

2. To carry, when obtainable, a key or keys to enable him to open the doors of common privies and ashpits which are kept locked, and to ascertain whether the same are kept clean; and if he finds them in an unsatisfactory condition, to require the persons to whose use the privies are appropriated to keep them clean and free from nuisance.

3. To recommend all persons to avoid throwing any liquid matter into the privy or ashpit, whether night urine, foul water from the house, or other fluids, unless containing fœcal matter.

4. To see, as far as practicable, that the doors of ashpits newly erected on the plans furnished by the Health Committee are kept locked and in good repair.

Cellar Areas.—To notice whether the areas of cellars that have been closed as unfit for human habitation are kept clean, and to report all in which he may find any accumulation of dirt; and to report any cellars occupied as human habitations after having been closed by order of the Corporation.

Open Grounds.—To report any accumulations of offensive matter on open or waste grounds.

Streets, Courts, and Passages.—To inspect daily the condition of the streets within his district, and to report all accumulations of foul water arising from the stoppage of street grids, or from the bad condition of the streets, and also any accumulation of offensive matter in the streets; also to inspect all courts and passages, and report all such as are in bad condition, or in which there are collections of fluid or solid matter.

To see that all courts and passages are kept in a proper state of cleanliness.

To report all back yards and privies and ashpits which require to be drained, cleansed, or limewashed, or which are not in a proper state of repair; and to give special attention to the condition of the drains connected with each house, and to report all houses which are inefficiently drained.

Registered Lodging Houses.—To inspect all registered lodging houses within his district, and to inform himself as to the number of persons from time to time residing in each of such houses; also the number of persons in each room, the size of each room, the state of each house as regards cleanliness, and the means of ventilation. To inquire in what places the water for drinking and for culinary purposes is kept, and whether it is daily renewed; to report any of such houses which are found to be dirty, and to require them to be cleansed and whitewashed.

Workshops.—To ascertain the number and locality of all workshops in his district wherein fewer than fifty people are employed. To inform himself of the number of women and children employed therein, their hours of labour, times of commencing and discontinuing work, and the time allowed for meals; and to report all places of this description in which it is found that the requirements and regulations of the Workshop Regulation Act have been infringed.

Infectious Diseases.—To endeavour to inform himself of the occurrence of any infectious diseases within his district, such as smallpox scarlet fever, and typhus fever, and to report each day every such case that may come to his knowledge.

To endeavour to persuade the infected persons, or the friends of such persons, to allow their removal in the conveyances provided for that purpose, and not in any public carriage, to hospital as early as possible.

In all cases where he shall discover the presence of infectious disease in a house, whether one of the three diseases first mentioned or measles or whooping cough, he shall endeavour to dissuade the occupants of the neighbouring houses from making needless visits to the infected house, and point out to them the certainty of their receiving the infection in case such advice be disregarded. He may also explain that undue exposure to contagion of a case of smallpox is a penal offence.

Houses in his District.—To make himself generally acquainted with the houses in his district, and to endeavour to ascertain in what particular portions sickness more especially prevails.

To inform himself of the number of back-to-back houses in his district, and how many "through" houses; the number of cellars inhabited as human dwellings, and of how many rooms such dwellings consist, and their condition in regard to dampness, darkness, and cleanliness, and by how many people occupied. To ascertain how many houses there are in each court, how occupied, and their condition.

To report all property requiring sanitary alteration, either in the construction of privies and ashpits or otherwise, and all houses and cellars unfit for human habitation through defective ventilation, want of cleanliness, or deficiency in privy and ashpit accommodation.

To endeavour to place himself in friendly relationship with the inhabitants of the poorest portion of his district, and to urge them to keep their houses clean, and to ventilate them as efficiently as may be practicable; to remove as quickly as possible all offensive matters, and to abstain from the consumption of all injurious food, such as putrid fish or unsound vegetables, &c.; and in case the walls and ceiling of any house require to be limewashed or cleansed, to give notice thereof.

Each inspector will have to attend to all complaints of nuisances in his district, and to report all offences of the following nature, viz.:—

Property without spouts or gutters, or in which the same are not properly connected with the drains.

All offensive matter, rubbish, ashes, &c., deposited in streets, or allowed to fall into any sewer or stream, &c.

All newly-established works of a noxious or offensive character.

Any animal so kept as to be a nuisance.

Pigs kept in any place which on sanitary grounds may be deemed unfit for such a purpose.

All houses without a sufficient supply of water.

All illegal interments in cemeteries.

All public and other urinals in a dirty state.

All nuisances arising from slaughter-houses.

There were some additional Police duties assigned to them, but as these had no bearing on the sanitary condition of their districts, they are here omitted.

They were also supplied with the following Regulations relating to Lodging-houses:—

Regulations made by the Mayor, Aldermen, and Citizens of the City of Manchester, in the County of Lancaster, in Council assembled, this 26*th day of October*, 1870, *under and in pursuance of the* 35*th Section of "The Sanitary Act*, 1866."

1. No keeper of any house, or part of a house, which is let in lodgings, or occupied by members of more than one family, situate within the city of Manchester, shall permit to occupy the same a greater number of persons than as hereafter mentioned.

2. The person paying or liable to pay rent for such house, or part of a house, or whose name is entered as the occupier thereof in the Poor Rate Book, shall be deemed to be the keeper thereof for the purposes of these Regulations.

3. Every room occupied by a lodger as a living room, or as a sleeping room, or as a living and sleeping room, shall contain not less than 500 cubic feet.

4. The keeper of every such house, or part of a house, must apply to register the same at the office of the Superintendent for the time being of the Nuisance Department of the Corporation; and if upon examination such house, or part of a house, is found in proper condition, and in accordance with these Regulations, the applicant will receive a Ticket stating the entire number of persons allowed to sleep in each such house, or part of a house; and he is to produce such Ticket whenever required by any Inspector of Nuisances.

5. The keeper of any such house, or part af a house, shall put up, in a conspicuous place in each room, a Ticket, signed by the Superintendent,

stating the number of persons allowed to sleep in such room, and shall keep such Ticket at all times visible and legible.

6. Two children under ten years of age to be counted as one person.

7. Each room occupied as a sleeping room shall be furnished with bedsteads, and sufficient bedding for the number of lodgers authorised to be received in such room.

8. Rooms in the basement, or below the level of the ground, shall not be occupied as sleeping rooms.

9. Rooms used as kitchens or sculleries shall not be occupied as sleeping rooms.

10. The keeper of every such house shall reduce the number of persons upon receiving notice to that effect from the said Superintendent, which notice must state the special cause of the same being given, and the period during which it is to continue in force.

11. Persons of different sexes shall not occupy the same sleeping rooms, except married couples, or parents with their children under ten years of age, or any children under ten years of age.

12. More than one married couple shall not occupy the same sleeping room, unless the beds are separated by a partition, to secure the privacy of each married couple; such partition to be of wood or other solid material, and of such height as shall be fixed in each case by an Inspector of Nuisances under the supervision of the Superintendent.

13. The keeper of every such house shall cause the walls and ceilings of every room, and of the staircases and passages of such house, to be thoroughly cleaned and well and sufficiently limewashed twice (at least) in every year, during the months of October and April; and shall cause the floors of all the rooms, passages, and stairs of such house to be kept at all times clean, and washed, and swept as often as necessary; and the blankets, rugs, or covers, and sheets used in such houses, shall be kept clean and in a wholesome condition.

14. The keeper of such house shall cause every room and the passages in such house to be ventilated to the satisfaction of an Inspector of Nuisances.

15. The keeper of such house shall provide such accommodation for washing, and such a supply of water, as shall be satisfactory to the Inspector of Nuisances.

16. The keeper of such house shall, when a person in such house is ill of fever, or any infectious or contagious disease, give immediate notice in writing to the Superintendent, at the Nuisance Office, Manchester.

17. The keeper of such house shall forthwith cause all other persons to be removed from the room in which any person is ill of fever or any infectious or contagious disorder, and shall make such reduction in the number of lodgers in each room of such house as shall be directed by an Inspector of Nuisances.

18. The keeper of such house shall use any disinfecting process which may be directed to be used by an Inspector of Nuisances, and shall cause the blankets, rugs, and bedding used by any person affected by such fever or disorder to be burnt or thoroughly fumigated and cleansed immediately after the removal of the person affected by such fever or disorder, in such manner as may from time to time be ordered by such officer.

19. The yards and areas of every such house shall be properly paved, so as to run dry, and effectually take off all waste water.

20. Every such house shall have a proper drain, communicating with a common sewer, where such a sewer is within 100 yards of the premises.

21. Every such house, or part of a house, may be inspected by the Superintendent of Nuisances, who may enter the same either by day or night; and any person refusing him admission, or obstructing him, shall be liable to the penalty hereafter stated.

22. *Penalty.*—The penalty for every breach or non-observance of any and every part of the foregoing Regulations shall be a sum not exceeding Forty Shillings, and an additional penalty of not exceeding Twenty Shillings for every day during which a default in obeying the above Regulations may continue.

Philip Holland, Esq., of the Burial Acts Office, has kindly furnished the Officer of Health with the following particulars respecting the closing of burial grounds within the city.

Angel Meadow New Burial Ground.—"That this burial ground be covered with asphalte, stone, or other hard material; also, that it be fenced sufficiently to prevent intruders." Order dated 17th May, 1867.

Christ Churchyard, Every-street.—By an order of August 3rd, 1867, the closing of this churchyard was postponed, on condition that the orders of 8th December, 1855, and 22nd October, 1856, be observed, and that burials in this churchyard be under the supervision of the Sanitary Committee of the Town Council.

St. Mary's Church and Churchyard, by an order of 19th June, 1868, were to be forthwith wholly closed.

All-Saints' Churchyard.—The closing of this churchyard was postponed to 31st December, 1871, certain conditions as to burial to be observed in the meantime, and the Sanitary Inspector to be informed of any intended burial.

The Rusholme-road Cemetery, though not mentioned in Mr. Holland's list, has also been partially closed during the time covered by that list, as well as the burial ground connected with St. George's Church, Hulme.

The fine range of public abattoirs now approaching completion in Water-street, constitute another large addition to our means of suppressing one of the great evils of such a city as Manchester,—the existence of private slaughter-houses. Of these there are not less than 150 in the city, and though they are placed under inspection, and there exists on the part of the butchers a thorough desire to keep them in a clean and good condition, yet many of them are placed in densely crowded localities, and it is impossible but that the drainage from them, becoming putrid at all times of the year, but especially in hot weather, must be a source of disease to the neighbouring inhabitants. Typhoid fever and diarrhœa would be very likely consequences of such a condition of the sewers and drains as might be expected in their localities.

The admirable spirit in which the butchers generally have met the wishes of the Markets Committee, leaves no doubt that they will avail themselves of the superior advantages secured for them in these well-planned structures, and that private slaughter-houses in a short time will no longer be found in the city.

From a conviction of the unwholesomeness of cellar dwellings, derived from a careful inspection of a large number situated in various parts of the city, the Health Committee determined on proceeding with the closing of these habitations with greater rapidity than heretofore. During the last two years a large number have been closed. The total number closed by the Committee since the commencement of its sittings amounts to about 2,400; and at the present time, with the exception of a few temporarily occupied by very old people, it may be said that there are no cellar dwellings in Manchester.

The effect of the closing of the cellars has not been to increase the density of population in the houses above them, for it appears by the results of the census taken in April last that there are fewer persons per house at the present time in Manchester than at the taking of the census in 1861. The police regulations in respect to over-crowding no doubt have had great influence in preventing this.

The evacuation of the cellars has produced on the houses simply an action of displacement. No cellar has been closed without a previous visit and recommendation by a Sub-Committee.

It may reasonably be expected that the removal of a large number of persons from underground dwellings will effect an improvement in their general health, and render them less prone to take on diseases of a low type. To the young especially, light is as necessary for healthy development as air; and when we consider that even the air which finds access to these sunken habitations is obtained from the level of the sewer openings, and that, in many instances, the invigorating rays of the sun never reach their interior, it can excite no surprise that the blanched and flabby children of which they are the homes, grow up into the stunted men and women that crowd the streets of our manufacturing towns.

At a very early period after the formation of the Health Committee, attention was directed to the general condition of the ashpits and privies within the city. Most of them were found to be open cesspools,—pestilential, fever-breeding, seething masses of putridity, emptied only at long intervals,—covered with bubbles of noisome gases, whose bursting continually discharged into the atmosphere their offensive odours, whilst the connection by means of drains of the privies with the sewers converted the latter into vast underground cesspools.

Had it been possible, with the limited supply of water available for the city, to have converted the whole of the privies into water-closets, the offensive condition of the sewers would only have been aggravated.

This consideration, and the doubt whether a due supply of water could be obtained, determined the Committee to enter upon a series of experiments to test the efficiency of dry closets, constructed in accordance with certain requisitions.

To improve the condition of the sewers, it was determined to close all connection between the privy and ashpit and the sewers, the floors of the privies were therefore constructed of an impervious and imperforate material having no grid or opening of any kind. At first, thick Rochdale flags were used; but for sometime past the floor has been formed of a very thick pan of brown earthenware.

To secure the frequent emptying it was decided that the body of the ashpit and privy should be small, so that no accumulation extending over several weeks should be formed, as in such case decomposition and putrefaction were inevitable. It is the opinion of the Officer of Health that the contents should be removed not less frequently than once a week.

To provide for the daily covering of the excreta, and the absorption of the liquid portion (the urine), the ashpit doors were kept locked, and thus all the ashes of the houses in connection with the privy were necessarily put down the seat and over the excreta, the seat being hinged for this purpose..

Whatever arrangements may be made, whether for water-closets or dry closets, there is always a certain amount of smell from them, and in all cases it is desirable, especially under circumstances where decomposition may have commenced, to carry away the smell and any gaseous results of decomposition to an elevation at which they may become subject to atmospheric currents. To effect this, a flue has been carried from the ashpit to an altitude above the eaves of the houses.

In order to keep the ashpit as dry as possible, it is ordered to be covered or roofed, and all house slops excluded.

Provided that the objects contemplated in these arrangements be effected, the Committee are ready to consider any modification that may be submitted to them.

Every year's experience, however, has convinced them of the soundness of the principles of construction they have adopted, and they are satisfied that if the ashpits can be emptied with sufficient frequency these dry closets will be less offensive and less injurious than water-closets.

It has been always held in view that, to facilitate frequent emptying, movable receptacles would ultimately be adopted, and the whole of the ashpits have been so constructed as to allow of their introduction at any time.

It has also been steadily kept in view that the exclusion from the ashpit of all matters except the excreta, animal and vegetable refuse, and fine ashes, though not necessary in a sanitary sense, is very desirable in relation to the value of the contents of the ashpit as manure,—the introduction of cinders, broken vessels, and other rubbish, interfering not only with their value, but also adding materially to the cost and labour attending its removal. The Officer of Health, therefore, and those acting with him, have for a long time been testing different arrangements for separating the fine ash from cinders, with a view to deliver the ash over the excreta and to render the cinders usable again. For a considerable time past some simple self-acting arrangements have been at work, by which this object is very effectually secured.

The Committee have up to this time caused to be re-constructed, on the principles above enunciated, 2,200 privies and ashpits in some of the worst parts of the city.

It must not be supposed that because other subjects of sanitary importance have been brought less prominently before the public, they have not therefore received the attention of the Committee and of the Officer of Health. Such subjects as—

The ventilation of drains and sewers,
The flushing of drains,
The treatment of sewage,
River pollution,
Ventilation of houses,
Construction of houses in accordance with sanitary requirements,
Washing of streets,

and several other important matters have for a long time past occupied the attention of the Committee and of the Officer of Health.

Looking, however, at the magnitude of the operations to be undertaken, and of the interests involved in bringing into better condition such an Augean stable as Manchester, it has been thought best, whilst organizing such arrangements as had become necessary for keeping in check several diseases always current amongst us, and for controlling and subduing certain epidemics with which we have been visited, to take in hand and deal steadily and continuously with a limited number of recognized evils, so as to effect as early as possible their extinction, taking the remainder in such succession as seemed to be the most feasible, rather than by spreading their efforts over a greater surface, effecting perhaps a smaller amount of permanent good.

The ventilation of drains and sewers must evidently be accomplished by connecting the ventilators with the highest part of the sewer system, that is, with the drains traversing the yards, passages, courts, &c. of the city, for it is in these that the most active decomposition is ever going on, as their contents are the most stagnant. And it is to these, as the highest parts of the system, that the gases generated below always make their way and seek to make their escape. Whether there may be in some of the sewers a downward current of their aërial contents matters little, as ventilators so fixed would be equally efficacious in clearing out the sewers and drains.

For a considerable time past the rain-spouts or down-spouts connected with houses have, in all new streets and in streets that have been re-paved, been brought into communication by careful adaptation and connecting with the neighbouring drains or sewers, with a view to effect a partial ventilation; and in the meantime a map of the sewerage of the city, exhibiting also the minute ramifications of the drains, has been in course of construction, the levels being taken with the object of effecting a more thorough ventilation, after certain necessary investigations have been completed.

A very important means of improving the condition of the drains and sewers would be that of flushing them periodically with water; but it is feared that the present supply is insufficient for this purpose, whilst there seems to be some doubt whether the drainage area can be considerably extended. The same observations apply to the washing of streets.

What to do with our sewage is a question which has received great consideration at the hands of engineers, chemists, sanitary reformers, and patentees. So various have been the methods proposed for treating it, that during the time required for the issue of most of these, it may be permitted to consider shortly what the sewage is that we propose to treat, and how formed. The following Report was during last year read to the Committee by the Officer of Health:—

Sewage.—By the word "sewage," I understand the contents of sewers.

These contents are composed of water holding in suspension or in solution—

A.—Excretal or fœcal matter, derived from

1. The drainings of privies and ashpits.
2. Water closets.
3. Urinals—
    - *a.* Public.
    - *b.* Connected with public-houses, &c.
    - *c.* " railway stations.
    - *d.* " mills, factories, workshops, &c.
4. Chamber slops from houses, consisting principally of urine.
5. Drainage from stables.
6. Drainage from manure heaps and from collections in scavengers' yards.

B.—1. Drainage from slaughter-houses.
  2. " knackers' yards.
  3. " tripe dressers' premises.
  4. " cow-heel preparers' premises.
  5. " skinners' yards.
  6. " cat-gut makers' yards.

C.—Slops from houses, consisting of—
  1. Water in which animal and vegetable food has been boiled, and holding in suspension and solution albuminous and gelatinous matter.
  2. Water that has been used for washing, and holding in solution soap and alkali, and having in suspension dirt from persons, clothes, and furniture, with that from the cleaning of houses.

D.—Washings of streets by rain water, &c., consisting of mineral detritus from the wasting or degradation of road surface mixed with horse dung and with vegetable fibres.

E.—1. Cleansing water of print works, dye works, paper works, sizing works, &c.
  2. Solutions of various dyewood colouring matters.
  3. The heterogeneous waste products of chemical manufactories.

From these sources mainly is the present composition of the sewage derived, and it is seen that they may be easily classified in distinct groups.

The chief pollution of the sewage—that which gives it its noisome character and makes it injurious to health—is effected by excretal matters (fœces and urine) comprehended in Class A, and by other animal matters included in Class B, the most considerable of which is slaughter-house refuse.

Imagine a sewage containing impurities contributed only from Classes C, D, and E. The sewage might be black from dyewoods and from salts of iron. It might be acid or alkaline, according as acids or alkalies predominated in the refuse of the various chemical and other works discharged into it. It might be largely charged with mineral salts, and have notable quantities of congealed fatty matter floating in it, separated from the soap contained in the washings poured into it by earthy or metallic salts, or by acids. It might contain abundance of mineral detritus. It might be fatal to fish life; but if it contained no sulphurets, it is doubtful whether it would be injurious to human health.

On the other hand, imagine a sewage from which all the impurities of the Classes C, D, and E were excluded, but which contained those of A and B in the large quantities that would be contributed by a considerable city. With a fair supply of water the sewage would be colourless, whitish, or straw-coloured; would contain floating particles of vegetable fibre, yellowish or brownish granules, and flocculent masses. The smell would be sickly, mawkish, and putrescent.

The greatest number, if not nearly all, of our dye works, print works, chemical works, and other various manufactories are seated upon or very near to the banks of the rivers and brooks that run through Manchester, and deliver into these rather than into the sewers their liquid waste products. These products are delivered for the most part either directly into the streams, or are conveyed to them by short conduits, and hence it is that our sewage is on the whole but little coloured.

It is evident, then, that if the impurities arising from the sources enumerated under Classes A and B were excluded, the contents of the sewers would mainly consist of water charged with the impurities named in Classes C and D, viz., washing water, holding soap, &c., in solution with some dirt in suspension; cooking water, holding some extracts from vegetable and animal fresh articles of food; and the washings of streets and roofs of houses by rain-water, holding some mineral detritus and organic matter in mechanical suspension.

It is further evident that such sewage as this, in a sanitary sense, would be greatly different from that which now occupies the sewers of this city.

Let us now address ourselves to the consideration of that which makes a vast underground cesspool of our city; which vomits forth its products of decomposition at every untrapped opening and vent; which is the generation of fever in our midst; and which pollutes rivers, brooks, and streams till they reek of putridity and corruption.

It is scarcely necessary to repeat that it is under the Classes A and B that we are to seek for the sources of this putridity and corruption, and it is to the possibility of dealing with these that we must apply ourselves.

The waste products from the last four sources enumerated under Class B are probably so inconsiderable in amount, and may be so easily dealt with, that they may temporarily be dismissed from consideration.

With reference to B 2—Drainage from knackers' yards—I am not aware how many of the latter there may be within the boundaries of the city, but I imagine there are very few, and that drainage from them into the sewers may be easily prevented.

Undoubtedly the largest amount of drainage under Class B will be that from slaughter-houses (No. 1). This will consist chiefly of the serum of the blood of the slaughtered animals, with some small portion of the coagulum or fibrinous part, and a certain amount of drainage from excrementitious matters.

The serum of the blood, which is the most abundant material that passes from the slaughter-houses into the sewers, contains a quantity of albumen which is liable to become putrid in the sewers, especially in warm weather. At the present day there is a considerable demand for this albumen for the use of calico printers, and the preparation of dried albumen has become a special manufacture, and hence it is probable that the drainage of any of the constituents of blood may come to be diverted from the sewers.

As the large and commodious public abattoirs now near their completion in Water-street, will probably in a short time supersede and lead to the suppression of all private slaughter-houses, so a more complete utilization of all refuse matters will be effected, and any drainage into the sewers be prevented.

What is known as the garbage or offal of slaughter-houses is at present conveyed away from the premises at short intervals.

The droppings of the animals and the contents of the intestines are stored away in middens or dung heaps, which no doubt drain into the sewers, but this might be easily prevented by the provision of tanks, or by frequent removal. It is probable that at the new abattoirs these matters will undergo daily removal.

Under Class A we find Nos. 3, 5, and 7 to be drainages from urinals, public and private, from stables, and from manure heaps, and also from collections in the scavengers' yards. The drainage from urinals and from stables may be collected in suitable underground tanks, from which it may be pumped at stated intervals, and utilized for the production of sulphate or sulpho-phosphate of ammonia.

It will be seen that the impurities derived by the sewers from the sources thus far indicated are *comparatively* small in amount and easily controlled: that they may be withheld from the sewers by arrangements of a simple character, and at a cost the interest of which would probably be met by the value of the collected material.

The impure and putrescent matters conveyed to the sewers are vastly greater in amount and much more serious in action from the sources A 1, 2, and 4;—excretal or fœcal matter from privies and ashpits, from water-closets, and urine from the night slops of houses.

It is a mere question of time when the drainage from privies and ashpits into the sewers shall cease. The alterations and reconstructions at present in progress, if continued at a proper rate, will entirely divert from the sewers the foul matters which now to a large extent give to the sewage its offensive and injurious character.

The diversion from the sewers of the excretal matters which now pass into them from water-closets can only be accomplished by the total suppression of these closets, and the substitution for them of dry closets, either supplied with earth, ashes, or charcoal.

The chamber slops from houses, A No. 4, consisting of urine, is the sewer pollution which is perhaps the most difficult to deal with. These slops at present are either thrown into the privy and ashpit, and drain from these into the sewers, made more offensive by contact with solid fœcal matter, or they are thrown at once into the drains or sewers by the grids in the yards or streets.

The quantity of urine discharged into the sewers of a great city is so large, and the difficulty of precipitating any of its important constituents so great, that it is difficult to conceive that any process of precipitation or of filtration, other than that presented by a considerable area and thickness of earth, can succeed in removing those constituents from the sewage. We cannot by any practical means precipitate urea from any fresh urine or ammonia from any putrid urine that may find its way into the sewage; neither can we precipitate the potash nor much of the phosphoric acid which is carried into the sewage by the urine. All the most valuable constituents pass off after precipitation in the effluent water. It is true that we can destroy the volatility of the ammonia, and give it a fixed but always perfectly soluble character in various ways, as by alum and other salts,—but it still passes away in its new state with the effluent water, thoroughly dissolved.

It is difficult to estimate correctly the quantity of urine that will pass into the sewers daily in a great city like Manchester. Taking into consideration the drainage at present from privies and ashpits, from water-closets, from urinals, and the accessions from house or chamber slops, the quantity must be enormous; nevertheless there must be a considerable amount which does not find its way into the sewers at all as urine, being received upon and decomposed in the soil.

Estimating the population of the city of Manchester at 350,000, and supposing each family of five persons, representing different ages and sexes, to pass within a period of twenty-four hours eight pounds of urine (I think this quantity would represent the liquid excreta of such an average family, without taking into consideration that of very young infants or children which would be lost), then the quantity for the whole city would be 560,000 pounds or 56,000 gallons daily. Of this quantity, 50,000 gallons would probably pass into the sewers.

For the purpose of experiment, I had the night and early morning urine collected of a family of six persons of the respective ages of

Male	36	years.
Female	36	"
Female	36	"
Child	11	"
Child	7	"
Child	4	"

Four gallons of this urine was introduced into a glass retort and distilled to dryness, the last contents of the retort being charred by the heat. The distilled liquor and the sublimate being neutralized by sulphuric acid, gave on evaporation 17¾ ounces of sulphate of ammonia, equal to 124 cwts. for 50,000 gallons or to 2,263 tons per annum.

At the present price of sulphate of ammonia, £23. per ton, the value of this would be £52,049.

It is scarcely necessary to say that were sulphate of ammonia to be manufactured from urine, sulphuric acid need not be exclusively used for neutralization, though a little might be used to complete the saturation of the ammonia. About a ton and a half of powdered sulphate of lime, worth about twelve shillings, would be theoretically sufficient for the formation of a ton of sulphate of ammonia. The whole cost nearly would lie in the collection.

At the present time the collection would be confined to the urine which could receive storage in tanks connected with public urinals, the number of which might, perhaps with advantage, be largely increased, and to that available from private houses as chamber slops, for the reception of which also simple arrangements could be made. It would not really be necessary to wait for the completion of the new privy and ashpit system, or for any extension of it, as the arrangements for storage and collection could be made quite independently of these.

So far as the class of houses is concerned for which water-closets are provided, it is probable that no arrangements could be made for the collection of urine, the facilities afforded by these closets for the disposal of the chamber slops of a house being too great. Nothing but the substitution of dry closets and special police requirements in respect to the storage of urine would meet the case.

Excluding, then, from consideration the urine at present conducted away through the intervention of water closets, there would probably remain about 45,000 gallons daily available for collection.

If sulphuric acid were used exclusively for the saturation of the ammonia, then a very small amount of evaporation would be required, as the ammonia could be distilled off from the urine directly into the acid, and this would come off with a very small quantity of water.

Considerable advantages would attend the employment of sulphuric acid instead of sulphate of lime. A much smaller plant would be required, the evaporation would be diminished by three-fourths, and a nearly pure sulphate of ammonia would be produced.

To produce 2,263 tons of sulphate of ammonia 2,343 tons of sulphuric acid, containing 65 per cent. of dry acid, would be required, which at £4. per ton would amount to £9,372.

When it is considered that we are sending out ships thousands of miles to fetch over to this country concentrated urine in the form of guano—for though this latter be the solid excrement of birds, yet its fertilising properties are due to the ammonia and phospheric acid it contains, the main constituents of fermented human urine (the urine of birds forming the guano is itself solid)—and that we are sending down into our rivers and away into the sea almost every gallon that is excreted in our great cities of the most valuable and most highly fertilising of all manures,—that we are polluting our sewers and drains with it, generating foul and fever-breeding gasses therein, it seems almost a punishment due to our folly and wasteful extravagance that that which should be to us a source of renewed nourishment and health, applied to its proper use, should become a cause of disease and death as a consequence of its waste. From the soil it is derived and to the soil it should return, and not to the rivers or the sea.

I think it is evident that were sufficient time allowed for the contemplated structural alterations in our city—for the concentration of our slaughter houses and manufactories of animal products, and for the utilization of our excreta, the sewage of the city would be of such a quality that very simple means of precipitation, even if this were necessary, would render it sufficiently pure to be run into the rivers; but if we are compelled to deal with it within a brief period, then in the peculiar circumstances of our city the precipitation of its floating or suspended matters by such materials as experience may show to be the most efficacious for the purpose, will probably best bring it into a condition to satisfy temporarily the requirements under which we may be placed.

Believing as I do that the precipitated matter will seldom be of considerably greater value than that of the precipitants added, it seems to me that the precipitants which are the most rapid in their action,—which form the smallest amount of deposit over and above that of the original floating matter, and which entail the smallest initial cost, will be preferred.

If precipitants should be discovered which will render insoluble to a considerable extent the dissolved animal matters in the sewage, this will give them additional value, as tending to lessen the putrefactive tendency of the sewage, whilst the precipitate will be improved as manure to that extent. I allude to matters of albuminous or gelatinous types.

The great difficulty as regards the application of sewage to irrigation consists in the great breadth of surface that would be required, and the consequent heavy original outlay that would be necessary for the purchase of land and for the conveyance of the material, an outlay not hitherto compensated by agricultural results.

It is a process which may be the best under special circumstances, but it necessitates the conveyance by water of the *whole excreta* of a community for its full development and success.

The persons who propose to deal with the excreta of a city may be conveniently divided into two classes. By the one its removal is sought to be effected by the utmost enlargement of its volume, and the greatest extension of its surface with consequent diminution of its intensity. The other party seek its concentration.

The difficulty of dealing with large volumes of polluted liquid by any of the suggested methods has led to the consideration of the possibility of sufficient clarification by what has been called cubical filtration; in other words, instead of seeking the oxidation of sewage by extensive surface and by green herbage, attempts are to be made to deodorise it by passing it through a considerable thickness of soil, in fact by downward filtration. The land is to be taken vertically instead of horizontally, and fertilization to be put out of consideration.

The ventilation of houses must inevitably come under consideration, following the efforts made to secure a better surrounding atmosphere. The air in the rooms of most cottages is stifling and offensive from deficient ventilation, and the tests for organic matter show its presence almost constantly. The means of effecting a constant interchange between the inner and outer air are neither difficult nor expensive; but to become generally available some instruction as to their utility must be afforded to those on whose forbearance their successful use will depend, for the prejudice against them will be considerable.

Should the efforts which are being made to obtain better dwellings for the working classes than those they now inhabit be successful, the best means of effecting a due interchange of the internal and external atmosphere, without any inconvenient alteration of internal temperature, will be of considerable importance.

So much of the area of the city of Manchester is now covered, that but little unoccupied ground exists for the erection of new dwellings, and any attempt to provide improved habitations for such of the poor as are compelled to live within the limits of the city, must be directed rather to bringing into the best sanitary condition possible, under the circumstances of their position and construction, the houses already existing than to the construction of new model cottages. The latter are for the outlying townships; but the streets of Manchester are already formed, and the thousands of houses which line them, though they may be improved, cannot be demolished but at a cost which no practical man will venture to contemplate.

The great success which has attended the efforts of Miss Hill, in London, to bring some of the worst property into fair sanitary condition, affords great encouragement to attempts of the same kind in Manchester; and a sum of money which, expended on the barrack system would improve a very limited area, could be spread over a large surface in such a way as would produce a distinct impression on the general health of a large portion of the community.

Already the cellars have been closed, and now the cellar areas should be purchased and laid to the streets. The ashpits and privies are in course of rapid reconstruction, and will cease to be a nuisance. In proportion as that takes place will the contents of the drains and sewers become less offensive and injurious, whilst a short time must see an efficient system of ventilation adapted to the latter. All drains should be removed from underneath houses, and no pipes from within any house should have immediate connection with them. The sink pipes, cellar drain pipes, &c., should all be led outside the buildings and then cut off, so as to leave a free space between the cut end and the grid and trap which lead to the sewer. No drains on any consideration should be brought into or immediately under any dwelling.

With these points attended to,—with some simple but efficient means of house ventilation,—with the removal of dampness from the walls, moderately frequent whitewashing,—with attention to cleanliness, and prevention of overcrowding,—there can be no doubt that the sanitary condition of even our worst streets would be greatly improved, and with the increased comfort felt, it may be the demon of drink be less welcome.

Gradually we see some of the worst dens in the city demolished, and structures devoted to trade and manufactures rising on their sites, but the value of land within the municipal boundaries has become too high for this demolition to take place for the re-erection of cottage dwellings. The Council is endeavouring to obtain an extension of powers relating to the erection of new dwellings, and no doubt an improvement in the construction of such as may arise on our limited unoccupied area will result; but it is to the constituted authorities acting in neighbouring districts we must look for the proper control over the erection of the houses which must form the habitations of the better portion of our working classes.

It is to be regretted that the working men of Manchester have not yet realized to themselves the ease with which they might become the builders and owners of the houses it may be convenient for them to occupy, nor the value of such possession. In Birmingham not less than thirteen thousand houses have been built by and are owned and occupied by the working men, and this fact has no small significance when we consider the low death-rate which has for several years characterised that great town. No doubt they are healthier and better dwellings than would have been erected for them.

Now there are within a radius of five miles from the Manchester Exchange more than 50,000 men who are members of some benefit society. The Co-operative Society numbers about 5,000 members, the Odd-Fellows probably 20,000; then there are Foresters, Druids, and numerous other societies, the members of all which could easily spare five shillings per quarter or one pound a year. Thus by a very moderate effort on the part of these men a sum of £50,000. every year could be raised to provide themselves with better houses.

If they could be moved to the adoption of this course, and their efforts be supplemented by loans from a society formed by the classes above them, considerable amelioration of their condition would result. The loans could be advanced on the security of the properties erected or purchased. A subscribed loan capital of £50,000. is alone requisite to give the necessary impulse.

On a plot of land near the Polygon, in Ardwick, a number of houses have been erected, in the construction of which the recommendations of the Officer of Health have been carried out. The drains and sewers lie entirely outside the buildings, and have no immediate communication with them. From the highest point of the sewage system connected with each block of buildings a ventilating shaft is carried to an altitude considerably above the eaves of the houses. The cellars are laid with asphalt or cement, and are perfectly dry. From their lowest point near the outer wall a short drain pipe is led through the wall, its upper aperture being protected by a bell-trap. The pipe terminates just outside the wall, and any liquid passing through it falls upon a grid and trap placed about 18 inches below it in the cellar area. To allow of this the cellar area is sunk 18 inches below the level of the cellar floor, instead of being merely the depth of the cellar window as in ordinary cases The sink pipes from the kitchen and scullery are similarly led outside the wall into the yard at the back of the house, and terminate a considerable height above the grid and trap which form the commencement of the drain in the yard. The privies and ashpits are constructed on the plan of the Health Committee, and have lofty flues. Every room is ventilated by a distinct arrangement, and is in communication with the external air by an aperture in the ceiling. There is no possibility of the entrance of sewer gases into any of the houses. It is possible that the mode of ventilating the rooms may be improved upon, but hitherto no complaint has been made of down-draught or other inconveniences, whilst the freedom from all smell or fustiness in the rooms is striking.

I conclude this portion of my Report with a few remarks on the Smoke Nuisance.

A fire fed with coke gives off no smoke. Coke is coal deprived of its hydrogen by heat chiefly in combination with carbon. Coal submitted to a high temperature in a furnace or in a fire-grate, gives off black smoke. Subjected to the same temperature in a closed vessel, it gives off an invisible gas, which is mainly composed of hydrogen combined with carbon. When this gas is burned with an insufficient supply of air, the flame is yellow and smoky; with a larger supply of air it is white, and gives off very little smoke; when mixed with an excess of air, the flame is blue and quite free from smoke. The reason of this is that hydrogen has a much stronger affinity for the oxygen of the atmosphere than carbon has; consequently, when the supply of air that is of oxygen to the flame is insufficient for complete combustion, the hydrogen is burned first and the carbon is liberated, and passes off as black smoke; with a little more air, the carbon is partly burned; with an excess of air, as in a Bunsen's burner, the carbon is entirely consumed, and there is therefore no smoke.

When coal is thrown into a furnace, as under a boiler, it is partly distilled, as it would be in a closed vessel or retort by the heat beneath and around it. The gas that is directly evolved from the coal is invisible, as it would be in a retort, and has the same composition; but immediately meeting with a quantity of hot air, its hydrogen is burned and the carbon liberated, which swept onwards to the back of the furnace, escapes into the chimney, where it is beyond the reach of combustion, and escapes from its summit as black smoke.

If coal, then, be heated without access of air in a retort, there is no smoke formed, but an invisible gas. If heated with an excess of air there is also no smoke, but an invisible gas (carbonic acid and the vapour of water).

All the smoke of a furnace then proceeds from what is first an invisible gas, which meets in the furnace only as much air as is sufficient to burn its hydrogen, but not all its carbon. The moment this carbon reaches the chimney it is under all ordinary conditions beyond the reach of combustion. For its combustion it requires a high temperature. It is necessary therefore that the air be mixed with it before its temperature has become much reduced, which must be in some part of the furnace, or that the air itself be at a very elevated temperature when it meets the carbon. Either, therefore, air of moderate temperature must be admitted to the carbon in the body of the furnace, or air of a more elevated temperature after it has passed from the furnace.

Thus the whole question of smoke consumption resolves itself into one of air supply to the carbon, and under a sufficient temperature to enable combustion to take place; and all plans, patents, and contrivances which disregard this are valueless.

Of the various contrivances which have been proposed for the burning of smoke, seme have been for the admission of a sufficient volume of cold air to the body or to the back of the furnace; others for bringing the smoke into contact with hot air.

The admission of a large body of cold air, as the latter acts on the surface of the boiler, so reduces the temperature of the latter as seriously to interfere with the tension of the steam; hence many processes have been discontinued which seemed to be promising enough. The superheating of air before its admission implies increased expense and space for the arrangements. The latter is an important consideration, as it cannot always be afforded. The cry for "more boiler room" is simply a cry for more air.

Of the different plans proposed, some are good and some are bad. Of the good some are better than others, and it is probable that a combination of the best features of some of the best plans would make a better contrivance than any of them. At the present time no single plan will answer for all arrangements.

The most scientific is that of Messrs. Siemens, but the plant required is enormous. By this plan the coal is all converted into gas, and the gas is burned in an excess of superheated air.

The time cannot be far distant when the smoke nuisance must be grappled with, and its abolition be demanded. Whenever it is rendered compulsory, it will probably be found that the abolition of the nuisance is a gain that will more than repay the cost of its accomplishment.

Why should not a conference of smoke producers and scientific men be held, fixed principles be decided upon, and a subscription be entered upon to defray the cost of really scientific trials on a scale sufficiently large to justify by their result the expenditure necessary in the practical adoption of the most successful processes?

As it is, manufacturers are often led under pressure to adopt crude, unscientific schemes, and after heavy expense, disgusted with their failure, feel themselves oppressed, and become incredulous of the success of any plans however scientifically designed.

The year just passed (1871) has been characterised by an epidemic of smallpox, the ravages of which have been felt much more severely during the last and preceding years in some of the great Continental cities than in this country. Nevertheless some of our large towns have suffered severely.

The deaths during 1871 from this loathsome disease were in—

	No. of Deaths.	Deaths per 10,000 of Population.
London	7876	24
Liverpool	1919	39
Sunderland	850	86
Newcastle-on-Tyne	695	54
Sheffield	406	17
Wolverhampton	284	41
Norwich	245	30
Manchester	271	7

Manchester.—The total number of deaths from smallpox within the city during 1871, was 225, viz., in

January	7
February	4
March	5
April	8
May	19
June	23
July	61
August	30
September	28
October	13
November	17
December	10

Of this number there occurred in the Registration Sub-districts of

Ancoats	26
Deansgate	13
London-road	6
St. George	19
Hulme	38
Chorlton-on-Medlock	16
Ardwick	14
Cheetham	3
Market-street	90

In the Market-street Sub-district are situated two large hospitals, viz.;—the Manchester Royal Infirmary and the Manchester Workhouse Hospital, into both of which smallpox cases were received, hence the high number of deaths appearing for this Sub-district.

In the Workhouse Hospital the deaths from smallpox during the year were 34.

In the Manchester Royal Infirmary 56, but of this number 10 were of persons who had been brought from localities not within the city, reducing the number of deaths of citizens to 46.

The deaths in the Infirmary date from the beginning of the year to the 10th October, at which date the new Fever Hospital at Monsall was opened for the reception of patients. The deaths from smallpox in the Monsall Hospital, from October 15th to the end of the year, were 20, but of this number there had been removed from the city of Manchester only 16.

In Dr. Leech's Report to the Board of Guardians of the Chorlton Union, dated January 20th, 1872, he states that 261 cases of small-pox were admitted into the Workhouse Hospital at Withington during the year 1871, and that of this number 43 terminated fatally. He further states that of the 261 cases there were removed from—

Hulme	122
Chorlton-on-Medlock	31
Ardwick	24
Total	177

These are the only townships of the Chorlton Union lying within the city of Manchester. Assuming the same rate of mortality as respects the 177 cases removed from the city as was found for the total of 261 received into the Workhouse, the former would represent a mortality of 28.

The total number of deaths, therefore, from smallpox originating within the city, or affecting persons residing in the city, will stand as follows:—

Deaths registered within the city	225
" in Withington Hospital	28
" in Monsall diito	16
" in Prestwich ditto	2
Total	271

What multiple should be taken to represent the relation of deaths to cases of smallpox seems to be a little uncertain.

Of the 261 cases admitted into the Withington Hospital, 43 died, or 1 in 6 cases.

In the Canal-street Hospital belonging to the Guardians of the Poor of Manchester, out of 236 cases admitted, 31 died, or 1 in 7·6.

Out of the total number of cases (465) received into the Manchester Royal Infirmary from January 1st to October 10th, 56 died, or 1 in 8·3.

Of the 394 cases received from Manchester, 45 died, or 1 in 8·75.

Of the 77 cases received from more distant localities, 11 died, or 1 in 6·45.

Of 136 cases received into the Fever Hospital at Monsall, near Harpurhey 16 died, or 1 in 8·5.

Of 1,235 cases attended in the Ebbw Vale district in South Wales, 118 died, or 1 in 10·4.

It is probable that the number 7 will pretty correctly represent the multiple by which to deduce the number of cases from that of deaths in Manchester, and 271 × 7 = 1897.

Now during the year the number of cases of smallpox reported to the Officer of Health, and attended to by himself and his officers, was 1775, or very nearly the entire number of cases that can have occurred within the city.

When the disease had become rife in London and in Liverpool, and was making its appearance in other towns that had long been comparatively free it became certain that Manchester would not escape, as the intercourse with Liverpool especially was constant and active. The Officer of Health therefore placed himself in communication at an early period with the Boards of Guardians of the Poor acting within the city of Manchester, and with the Medical Officers of the Privy Council, with the view to obtain a more thorough performance both of primary and secondary vaccination within the city. He had previously, by the kind permission of the Nuisance Committee of the City Council, employed nineteen of their inspectors to make a house-to-house visitation within their respective districts, and had issued to them the following printed instructions:—

Vaccination.—*Instructions to the Sanitary Inspectors of the Nuisance Committee.*

1. Each inspector shall make a house-to-house visitation throughout his district.

2. He shall represent to the inhabitants of each house that smallpox has for many months past been exceedingly prevalent and fatal in London and Liverpool, and in several other large cities and towns;—that during the week ending Saturday, May the 20th, the deaths from smallpox were in London 267, in Liverpool 50, in Newcastle 14, and in Manchester 10; that the annual death-rate from smallpox in Liverpool is equal to 5 out of every 1,000 persons living in Liverpool.

3. He shall also represent to them that smallpox is rapidly increasing in Manchester and Salford, owing partly to the infection being brought from Liverpool, and partly to the spread of the infection from persons already suffering from smallpox in Manchester and Salford; and that unless measures are taken to check the spread of the infection, it is likely to be as bad, that is, as prevalent and fatal in Manchester as it is in Liverpool and London.

4. That it has been ascertained *positively* that children who have been vaccinated either escape smallpox altogether, or, if they do take the disease, have it much more mildly than those who have not been vaccinated, and

generally recover; whilst children who have not been vaccinated almost certainly take smallpox, if exposed to the infection, and generally have it so severely as to die from it.

5. That people who have been *twice* vaccinated, that is, re-vaccinated, are in no danger from smallpox at all,—that they never take it, and may go about without any fear of infection; that in the smallpox hospitals in London the nurses and other attendants on the patients are always re-vaccinated when they enter into the service of the Institutions, and that not one of them, being protected by this, has ever been known to catch or take smallpox.

6. After these representations to the heads of families, the inspector is to endeavour to persuade them, by all the means in his power, to take their children *at once* to be vaccinated. He is at the same time to endeavour to induce those who have already been vaccinated to be re-vaccinated. He is to inform parents that by neglecting to have their children vaccinated they incur a considerable penalty, which will certainly be inflicted. If any objection be made to vaccination on the part of parents, he is to inform them that no injury to children or others, as the consequence of vaccination, has ever been proved to have taken place; and he may mention incidentally that the Officer of Health has had all his own family re-vaccinated.

7. He is to furnish to every separate family in a house a paper containing the name and address of the Public Vaccinator acting within his district, together with the times and places of his attendance for public vaccination. He is further to inform the heads of families, and other residents in the house, that the vaccination will in all cases be gratuitous.

8. The inspector will also carry with him a book, in which he will enter the names and ages of all the children in a house whom he may ascertain *not to have been vaccinated.* He will also enter the names and correct address of the parents. These he will deliver, at the end of each day, to Mr. Superintendent Rooke.

9. Should he discover during the course of his visits that smallpox exists in any house, he will not fail to communicate the information he has obtained, on the same day, to Mr. Superintendent Rooke.

There are in the city of Manchester, according to the last census, 67,430 inhabited houses of all classes, and in the performance of the duties assigned to them, the inspectors visited 62,254. They reported to the Officer of Health the names and residences of 3,958 young persons who had *not been vaccinated.* These were distributed into vaccination districts, and sent to the respective Boards of Guardians, with the result that 4,105 primary vaccinations were performed by the Public Vaccinators from May 27th to August 19th, and 3,901 re-vaccinations, or a total of 8,006 vaccinations in rather less than three months.

The following table will exhibit the progress of vaccination during the period of the inspectors' visitations :—

Week ending	Vaccinations.
June 3	83
" 10	236
" 17	578
" 24	905
July 1	1036
" 8	1067
" 15	1351
" 22	969
" 29	669
August 5	406
" 12	392
" 19	314

The adult population of the city was also exhorted, by private circulars and by placards affixed to the walls of mills and workshops and to the outer walls of houses, to seek immediate re-vaccination. The City Council subscribed £1000. for the year to the Manchester Royal Infirmary, with the understanding that all cases of smallpox should be received into the hospital that were sent by the Officer of Health. The officers, both of the Health and of the Nuisance Committees, were exceedingly active in obtaining the removal to hospital of all cases coming within their knowledge; and the houses, clothes, bedding, &c. of persons suffering from the disease were disinfected and cleansed as far as practicable.

From information kindly furnished by the Clerks to the Guardians of Manchester and of the Chorlton Union, the Officer of Health is enabled to lay before the Committee the following satisfactory statement of the number of vaccinations performed within such portions of the city as lie within the jurisdiction of the Boards during the year :—

Township of Manchester.—Number of persons vaccinated by the public vaccinators during the year ended December 31st, 1871 :—

Primary vaccinations	5533
Re-vaccinations	999
Total	6532

Townships of Hulme, Chorlton-upon-Medlock, and Ardwick—

Primary vaccinations	3421
Re-vaccinations	2792
	6213
Grand total	12745

Of the 236 cases of smallpox admitted into the Canal-street Hospital there were—

Vaccinated	157
Unvaccinated	68
Uncertain	11

31 of these cases terminated fatally, of which had been vaccinated 7, or 4¼ per cent.; unvaccinated, 24 or 35⅓ per cent. There had not been a single re-vaccinated case in the Hospital.

465 cases of smallpox were received into the Manchester Royal Infirmary from January 31st to October 10th, 1871. To the entries of these cases were attached the following marks :—

Unvaccinated, no scars	87
Vaccinated, simply	7
" with good scars	191
" " fair scars	80
" " faint scars	79
Uncertain	6
Number not appended	15

Of the 87 cases marked "unvaccinated," "no scars," 26 died; of the remaining 378 cases, 30 died.

The cases of smallpox received into the Infirmary appear to have been very carefully observed, and I am indebted to the great kindness and courtesy of Dr. Reed for the materials of the following analysis :—

Of the vaccinated cases marked "good scars"—
50 had 1 scar.
96 " 2 "
34 " 3 "
9 " 4 "
2 " 5 "

Of those marked "fair scars"—
18 had 1 scar.
42 " 2 "
17 " 3 "
2 " 4 "
1 " 6 "

Of those marked "faint scars"—
35 had 1 scar.
32 " 2 "
12 " 3 "

Of the 30 cases which terminated fatally and were not marked as "unvaccinated," &c.—

11 had 1 scar.
9 " 2 "
2 " 3 "
1 " 1 faint scar.
1 " 2 "
3 are simply marked "vaccinated."
3 had no mark appended.

Of the 261 cases of smallpox admitted into the Withington Hospital, 43 were fatal. Of these there were—

Vaccinated	9
Unvaccinated	19
Uncertain	15

In the first half of the year no exact record was kept as to whether those admitted into the smallpox wards had been vaccinated or not.

In the last half-year the condition of the arm was noted in every case on admission, and during that time 173 patients were admitted—

34 were unvaccinated, and of these 18 died.
108 were vaccinated, and of these 9 died.
31 cases were doubtful, and of these 6 died.

The Officer of Health has been favoured by Mr. Alderman Curtis with an interesting analysis of the cases of smallpox which have occurred in the Ebbw Vale district during 1871, and up to January 30th of the present year, which will be found in the Appendix.

It appears that there were 1235 cases attended, and of these 118 died. Of the fatal cases 9 had been vaccinated, 109 were unvaccinated. Not a single case occurred in any person who had been properly re-vaccinated.

Of the 394 cases received into the Royal Infirmary from Manchester—
11 were under 5 years of age.
42 " 10 "

Of the 45 deaths of Manchester persons in the Royal Infirmary—
6 were under 5 years of age.
11 " 10 "

Of the 16 deaths in the Monsall Hospital—
1 was under 5 years of age.
6 were under 10 "

Of the 34 deaths at the Manchester Workhouse Hospital, Canal-street—
5 were under 5 years of age.
9 " 10 "

Of the 225 deaths (total) within the city—
85 were under 5 years of age.
99 " 10 "

Hence it appears that of the 85 deaths of children under 5 years of age, only 11 took place in public hospitals; and of the 99 under 10 years, only 20 occurred in these institutions.

The Officer of Health cannot conclude this portion of his Report without expressing his conviction that to the prompt and continued coöperation with the Health Committee and with himself of the Boards of Guardians of the Poor and that of the Royal Infirmary, and to the zeal and activity of their officers, is due the salvation of the lives of a very large number of the citizens of this great community during the past year, to say nothing of the considerable number who, though surviving the attacks of the disease, yet would have suffered in health and comfort for the remainder of their existence.

The lesson of this epidemic ought not to be wasted. Smallpox is not a necessary or unavoidable calamity; it is one of the punishments of apathy, bigotry, ignorance, and folly, so simple and so readily attainable is the preventive, that the disease has become a crime.

Of the remaining zymotic febrile diseases it is satisfactory to find that the two over which we may be supposed to have some control, viz., fever and scarlet fever, have steadily diminished in fatality during the last four years. This is the more gratifying since these diseases, which have always prevailed more or less amongst us, have usually been regarded as tests of the efficiency of the means adopted for the diminution or suppression of the febrile infectious diseases, themselves being also regarded to some extent as tests of the sanitary condition of a community.

The deaths from febrile infectious diseases within the city during the last four years have been carefully revised, the whole of the death-registers of the city during that period having been re-examined, and the deaths from *conditions attributable* to the respective zymotics classed under these latter.

It will be seen from the following table that the deaths from "fever," under which term have been included all those recorded as from typhus, typhoid, enteric, gastric, nervous, maculated, and other designated forms were successively in the four years—635, 403, 392, and 282; and from scarlet fever, under which were included deaths from "dropsy following scarlatina," "sequela of scarlatina," &c., they were successively 1,258, 506, 264, and 230.

The months during which fever was most fatal in 1871 were January, February, April, October, November, and December.

The fatality from fever in the large and densely populated registration sub-districts has been singularly equal. Thus the deaths for each 1,000 inhabitants were, in—

Ancoats	0·77
Ardwick	0·79
St. George	0·72
Hulme	0·70
London-road	0·69

In Cheetham the proportion was so low as 0·28. The high figures for Market-street sub-district are owing to the two hospitals included in it, the deaths in which from this disease may perhaps, so far as they occurred in cases received from Manchester, be distributed in the ratio of the inhabitants of the respective sub-districts.

The identity in the figures of the above short table would seem to point to the operation of uniform causes acting with almost uniform intensity throughout these districts.

Scarlet fever, which is propagated more distinctly by infection, exhibits greater numerical differences. It was most fatal in September, October, and November, and found most victims in proportion to the inhabitants in Hulme, Cheetham, and Chorlton-on-Medlock.

Measles was most fatal in Ancoats, Hulme, and Chorlton-on-Medlock, and prevailed most in March, April, May, and June.

From whooping cough there were more deaths in November and December than during all the rest of the year, the largest mortality being in Ancoats, London-road, Deansgate, and Hulme sub-districts.

Until we have some better means of isolating cases of measles and whooping cough we shall have very little power in checking the spread of these diseases. The usual gaseous disinfectants can scarcely be employed in cases of measles, owing to the necessity for avoiding all irritation to the lungs, bronchitis being so very frequently a concomitant of this disease.

The opening of the new Children's Hospital, however, and a further portion of the new House of Recovery, may materially assist us. Whooping cough is usually a disease of so long duration that the isolation of the cases, though equally important, is a matter of extreme difficulty.

Fever.

Deaths within the city of Manchester from fever—1868, 635; 1869, 403 1870, 392; 1871, 282.

Deaths in Registration Sub-districts in 1871—

Ancoats	41
Deansgate	10
London-road	15
Market-street	65

St. George	42
Hulme	53
Chorlton-on-Medlock	28
Ardwick	22
Cheetham	6

Deaths in each month from fever within the city during 1871—

January	32
February	25
March	17
April	26
May	17
June	22
July	15
August	18
September	23
October	34
November	28
December	25

Deaths per 1000 inhabitants—

Ancoats	0·77
Deansgate	0·41
London-road	0·69
Market-street	3·73
St. George's	0 72
Hulme	0·70
Chorlton	0·55
Ardwick	0·79
Cheetham	0·28

Scarlet Fever.

Deaths within the city of Manchester from scarlet fever—1868, 1258; 1869, 506; 1870, 264; 1871, 230.

Deaths in Registration Sub-districts in 1871—

Ancoats	29
Deansgate	6
London-road	13
Market-street	18
St. George	31
Hulme	69
Chorlton-on-Medlock	37
Ardwick	10
Cheetham	17

Deaths in each month from scarlet fever within the city during 1871—

January	19
February	17
March	19
April	16
May	9
June	17
July	18
August	15
September	25
October	20
November	40
December	15

Deaths per 1000 inhabitants—

Ancoats	0·55
Deansgate	0·24
London-road	0·60
Market-street	1·03
St. George's	0·53
Hulme	0·92
Chorlton	0·73
Ardwick	0·36
Cheetham	0·81

Measles.

Deaths within the city of Manchester from measles—1868, 186; 1869, 306; 1870, 57; 1871, 260.

Deaths in Registration Sub-districts in 1871—

Ancoats	53
Deansgate	14
London-road	12
Market-street	21
St. George	38
Hulme	70
Chorlton-on-Medlock	37
Ardwick	10
Cheetham	5

Deaths in each month from measles within the city during 1871—

January	13
February	12
March	40
April	74
May	48
June	37

July	23
August	8
September	2
October	1
November	0
December	2

Deaths per 1000 inhabitants—

Ancoats	1·00
Deansgate	0·57
London-road	0·55
Market-street	1·20
St. George's	0·65
Hulme	0·93
Chorlton	0·73
Ardwick	0·36
Cheetham	0·23

Whooping Cough.

Deaths within the city of Manchester from whooping cough—1868, 230; 1869, 225; 1870, 390; 1871, 204.

Deaths in Registration Sub-districts in 1871—

Ancoats	50
Deansgate	16
London-road	21
Market-street	5
St. George's	27
Hulme	48
Chorlton-on-Medlock	16
Ardwick	14
Cheetham	7

Deaths in each month from whooping cough within the city during 1871—

January	7
February	4
March	7
April	9
May	7
June	3
July	6
August	3
September	19
October	19
November	35
December	85

Deaths per 1000 inhabitants—

Ancoats	0·95
Deansgate	0·66
London-road	0·97
Market-street	0·28
St. George's	0·46
Hulme	0·64
Chorlton	0·31
Ardwick	0·50
Cheetham	0·33

During the summer and autumn of 1871 diarrhœa was not only very prevalent within the city of Manchester, but was also exceedingly fatal. From the week ending July 1st to the week ending September 30th, both inclusive, 784 deaths were recorded from this disease, against 666 within the same period in 1870,—565 in 1869, and 889 in 1868. The total deaths from diarrhœa during the year were 973.

In 1868 the mortality from diarrhœa had already reached 43 for the first week in July, and never fell below 40 in any of the eleven subsequent weeks. The maximum number of deaths (87) was attained in the week ending August 8th, though there was little variation from July the 11th to September the 12th, the lowest number in any one week during that period having been 61.

In 1869 the deaths from diarrhœa in the first week of July were 8; they reached 74 in the week ending July 31st, and sank to 43 in the week ending August 28th.

In 1870 the deaths in the first week of July were 23; they rose to 77 in the week ending August 16th, and declined to 33 in the week ending September 17th.

In 1871 the deaths from diarrhœa in the week ending July 1st were 11, and they numbered 3, 15, 16, 32, 37 successively during the subsequent five weeks. In the week ending August 12th, they reached 54; in the next week ending August 19th they rose to 92, and in the four following weeks the numbers were in succession—108, 128, 105, 97. In the week ending September 23rd, they had declined to 44. Whilst in 1868 the mortality from diarrhœa was as high as 43 in the first week (ending July 4th) of the fourteen weeks ending at the beginning of October; in 1869 this number was not attained till the fourth week (ending July 24th); in 1870 till the fifth week (ending July 30th); and in 1871 till the seventh week (ending August 12th.) Whilst, also, during 1868, a high mortality from diarrhœa prevailed during the whole fourteen weeks, beginning with 43 deaths in the first week, and ending with 35 in the fourteenth week, in 1869 it prevailed during ten weeks only, beginning with 44 deaths in the fourth week, and ending with 37 deaths in the thirteenth week; in 1870 also during ten weeks, beginning with 40 deaths in the fourth week, and ending with 36 deaths in the thirteenth week.

In 1871 an equivalent mortality to that in the three preceding years did not commence till the seventh week, within which latter 54 deaths took place from diarrhœa, those in the preceding week having been 37. The high mortality continued during the eight subsequent weeks, having sunk, however, to 42 in the fourteenth week.

During five weeks of 1871 the mortality from diarrhœa was higher, having been successively 92, 108, 128, 105, 97 in the eighth, ninth, tenth, eleventh, and twelfth week, than during any similar period in the three preceding years. Indeed the disease had more of an epidemic character than has been the case for many years past.

Of the 784 deaths occurring from the week ending July 1st to that ending September 30th, only 21 occurred in persons above five years of age. Of the latter number the majority were of persons of very advanced age. So great had become the mortality, and so rapid its rise, that the Officer of Health felt it to be his duty to suggest to the Health Committee the adoption of some remedial measures, a suggestion which was promptly acceded to. The suffering poor availed themselves of the relief provided with an eagerness that was scarcely anticipated. In the absence of any registration of cases it is difficult to estimate the amount of benefit that was conferred, as we have no means of testing the relation of deaths to cases; but it is a striking fact, that in the three weeks during which remedial measures were adopted, the deaths declined from 128 per week to 44 per week, a larger rate of decrease than had taken place in the preceding years. Of course the decline is partly attributable to the decrease of temperature and to the advance of the season, but as the rapidity of decline from so high a rate was greater than usual or than had been observed in preceding years, a portion of the decline may be fairly ascribed to the means adopted for its mitigation. Good evidence was given that a great deal of human suffering was relieved, and a very grateful impression left on the minds of our poorest fellow-citizens.

The numbers given above show that the fatality from diarrhœa was almost entirely confined to early childhood. Out of 784 deaths only 2 occurred between the ages of 5 years and 21 years, and 19 deaths were in persons of advanced age. Of the remaining 763 deaths the majority were of children much under 5 years of age.

Deaths within the city of Manchester from diarrhœa :—

1868	1120
1869	791
1870	870
1871	973

Deaths from diarrhœa in the Registration Sub-districts of Manchester:—1871.

Sub-district.	Deaths.	Deaths per 1,000 of Populatiin.
Ancoats	212	4·02
Deansgate	84	3·47
London-road	88	4·08
Market-street	43	2·47
St. George's	201	3·42
Hulme	180	2·41
Chorlton-on-Medlock	78	1·55
Ardwick	60	2·15
Cheetham	27	1·29

The deaths in July, August, September, and October, were 878; whilst during the whole of the remaining eight months of the year they amounted to only 95.

A few general facts relating to autumnal diarrhœa may here be stated. The constant annual recurrence of the disease and the excessive mortality occasioned by it render the study of its causes, phenomena, and treatment one of paramount importance. Its fatality is almost entirely confined to young children.

It assumes an epidemic character only in the late summer and early autumnal months, and it is in many respects unlike the diarrhœa of other periods.

It is greatly more prevalent and more fatal in August and September than in any other months. In these months there is great diurnal vicissitude of temperature, and the atmosphere is generally heavily charged with moisture.

It prevails very much more in towns than in country districts. Its prevalence and the rate of mortality from it are very much in the ratio of the density of population.

It is more prevalent and relatively more fatal in the houses of the poor than in those of well-to-do people.

It is more prevalent in ill-ventilated localities, and especially where the atmosphere is tainted with fœcal matters, than in any others. It prevails more in low-lying grounds than at higher elevation.

It is not solely dependent on the quality of the water drunk, for the water of Manchester is good. Nor on a high temperature alone, for that of the summer and autumn of 1871 was low, and yet it was a heavy diarrhœa year. Nevertheless it rarely exists to any extent at the temperatures of the late autumn, winter, spring, and early summer months; and it is certainly most rife in any year at the period of its highest temperature.

The food of the children of the poor, especially when the mothers are occupied in daily labour away from home, is usually unsuitable the whole of the year. But during the hottest part of the year it is often more or less putrescent, or is in a state of incipient fermentation.

It is probable that to this cause and to the condition of the atmosphere, autumnal diarrhœa is mainly due. Nevertheless it may be that it is solely propagated by germs which receive their full development only at the hottest season.

The total number of deaths from all causes within the city during 1871 was 10,435, or 29·91 per 1,000 of the population. This is slightly in excess of the two preceding years, which were years of unusually low mortality. Deducting the deaths from smallpox and from diarrhœa, in excess of the mortality from those in the two preceding years, the rate of deaths per 1,000 in 1871 would be 29 05. The heaviest mortality occurred in the last two quarters of the year.

Death-rate per 1,000 of population :—1871.

Quarter ending March 25th	28·9
“ June 24th	27·0
“ September 30th	32·8
“ December 35th	30 7

The following table exhibits the death-rate in each quarter during the last four years:—

	1868.	1869.	1870.	1871.
First quarter	31·1	28·7	33·4	28·9
Second “	28·4	25·2	26 1	27·0
Third “	38·7	30 4	28·1	32 8
Fourth “	31·9	31·4	26·1	30·7

The Registration Sub-districts of Ancoats and St. George's on the east side of Manchester, with a joint population of 111,081, and hitherto regarded as the most unhealthy portion of the city, have exhibited a continuous improvement with a slight exception in St. George's district during last year, and it is to these districts that, in consequence of their bad sanitary condition, the efforts of the Health Committee have been much directed.

Ancoats.

Year.	Deaths per 1,000 of Population.
1868	33 9
1869	31·8
1870	30·1
1871	28·9

St. George.

1868	32·6
1869	29·1
1870	26·5
1871	27·5

The heaviest rates of mortality have been presented by the districts of Deansgate (30·4), and London-road (31·1).

The townships of Chorlton-upon-Medlock and Cheetham have preserved a very uniform rate of mortality during the four years. The rate in these townships is always comparatively low.

The most satisfactory results of the tabulation of the causes of death are afforded by the following short table of the death-rate from infectious febrile diseases during the last four years, from which it will be seen that even with the addition of the deaths from smallpox the low rate to which this had been brought in 1870 was scarcely exceeded in 1871 :—

1868.	1869.	1870.	1871.
6·8	4·3	3·3	3·4

The increased general rate of mortality in 1871 over the two preceding years is not entirely accounted for by excess of deaths from diarrhœa, though this is to be taken into account. The difference is made up by the increase of deaths from diseases of the lungs, as shown by the following figures.

Deaths within the city of Manchester from diseases of the lungs :—1869, 3,235; 1870, 3,120; 1871, 3,306.

The year 1871 was one of unusually low temperature, and an increase of deaths from diseases of the lungs was observable in young children in relation to those of adults.

Deaths under five years of age per 1,00 :—1869, 47·0; 1870, 45·8; 1871, 48·6.

Total number of deaths from all causes within the city of Manchester during the four years :—

Year.	Estimated Population.	No. of Deaths.
1868	345,295	11,242
1869	346,401	10,232
1870	347,701	9,906
1871	348,791	10,435

Total number of deaths from five zymotic diseases, viz., measles, smallpox, whooping cough, scarlet fever, and fever :—

1868.	1869.	1870.	1871.
2,342	1,505	1,138	1,201

Rate per 1,000 of population of deaths from all causes :—

1868.	1869.	1870.	1871.
32·55	29·53	28·48	29·91

Rate per 1,000 of population of deaths from the five zymotic diseases :—

1868.	1869.	1870.	1871.
6·8	4·3	3·3	3·4

Registration Sub-districts.—Total number of deaths from all causes during the four years:—

Year.	Estimated Population.	No of Deaths.	Rate per 1,000 of Population.
	Ancoats.		
1868	53,658	1,820	33 9
1869	53,326	1,698	31·8
1870	52.994	1,599	30·1
1871	52,694	1,527	28·9
	Deansgate.		
1868	25,576	1,017	39·8
1869	25,115	756	30·1
1870	24,654	715	28 5
1871	24,185	737	30·4
	London-road.		
1868	23,764	788	33·2
1869	23,061	636	27·5
1870	22,258	609	27·4
1871	21,555	671	31·1
	Market-street.		
1868	19,225	1,644	85 5
1869	18,611	1,527	82 1
1870	17,997	1,517	84·3
1871	17,383	1,479	85·3
	St. George's.		
1868	55,288	1,708	32·6
1869	56,321	1,633	29·1
1870	57,354	1,518	26·5
1871	58,387	1,613	27·5
	Hulme.		
1868	72,821	2,040	28·0
1869	73,448	1,924	26 1
1870	74.075	1,872	25·2
1871	74,702	2,198	28·1
	Chorlton upon-Medlock.		
1868	48,604	1,104	22·7
1869	49,136	1,059	21·7
1870	49.662	1,046	21·1
1871	50,194	1,114	22 3
	Ardwick.		
1868	25.995	763	29·4
1869	26,602	620	23 3
1870	27,209	653	24 0
1871	27,816	715	25 6
	Cheetham.		
1868	20,364	358	17·5
1869	20,781	379	18·2
1870	21,498	377	17·5
1871	21,915	381	17·3

Table showing the number of deaths in the respective Registration Sub-districts during the first two quarters and the last two quarters in each of the four years. First two quarters:—

Ancoats.

1868.	1869.	1870.	1871.
856	786	867	663

Deansgate.

1868.	1869.	1870.	1871.
506	364	397	341

London-road

1868.	1869.	1870.	1871.
367	334	298	280

St. George's.

1868.	1869.	1870.	1871.
738	719	809	715

Hulme.

1868.	1869.	1870.	1871.
871	912	909	1,057

Chorlton.

1868.	1869.	1870.	1871.
368	524	518	573

Ardwick.

1868.	1869.	1870.	1871.
355	309	314	308

Cheetham.

1868.	1869.	1870.	1871.
160	195	192	170

Last two quarters:—

Ancoats.

1868.	1869.	1870.	1871.
964	912	732	854

Deansgate.

1868.	1869.	1870.	1871.
511	392	338	396

London-road.

1868.	1869.	1870.	1871.
421	302	311	391

St. George's.

1868.	1869.	1870.	1871.
970	914	709	898

Hulme.

1868.	1869.	1870.	1871.
1,169	1,012	833	1,141

Chorlton.

1868.	1869.	1870.	1871.
636	535	528	541

Ardwick.

1868.	1869.	1870.	1871.
408	311	339	407

Cheetham.

1868.	1869.	1870.	1871.
198	184	185	211

TABLE *exhibiting the Ages at Death in the Registration Sub-districts during the two years* 1868-69, *also the proportion per cent. which the deaths at each age bear to the total number of deaths.*

For the Year 1868.

Names of Sub-districts.	Deaths, 1 year and under.	Deaths, 5 years and under.	Deaths, above 5 years.	Total Deaths.	Rate per cent., 1 yr. and under.	Rate per cent., 5 yrs. and under.	Rate per cent., above 5 years.
Ancoats	771	1100	720	1820	42·3	60·4	39·5
Deansgate	245	511	506	1017	24·0	50·2	49·7
London-road	284	440	348	788	36·0	55·8	44·1
Market-street	283	440	1204	1644	17·2	26·7	73·2
St. George's	515	957	751	1708	30·1	56·0	43·9
Hulme	823	1109	931	2040	40·3	54·3	45·6
Chorlton..................	283	493	611	1104	25·6	44·6	55·3
Ardwick	259	422	351	763	33·9	54·0	46·0
Cheetham	79	141	217	358	24·8	39·3	60·6
Totals............	3543	5603	5639	11242	31·5	49·8	50·1
	For the Year 1869.						
Ancoats	702	901	797	1698	41·3	53·0	46·9
Deansgate	254	392	364	756	33·6	51·8	48·1
London-road	216	328	308	636	33·9	51·5	48·4
Market-street	215	335	1192	1527	14·0	21·8	78·0
St George's	482	937	696	1633	29·5	57·3	42·6
Hulme	765	1003	921	1924	39·7	52·1	47·8
Chorlton..................	295	461	598	1059	27·8	45·4	54·5
Ardwick	206	322	298	620	33·2	51·9	48·0
Cheetham	95	138	239	377	25·0	36·6	63·3
Totals............	3230	4817	5413	10230	31·5	47·0	52·9

TABLE *exhibiting the Ages at Death in the Registration Sub-districts during the two years* 1870-71, *also the proportion per cent. which the deaths at each age bear to the total number of deaths.*

For the Year 1870.

Names of Sub-districts.	Deaths, 1 year and under.	Deaths, 5 years and under.	Deaths, above 5 years.	Total Deaths.	Rate per cent., 1 yr. and under.	Rate per cent., 5 yrs. and under.	Rate per cent., above 5 years.
Ancoats	695	858	741	1599	43·4	53·6	46·3
Deansgate	284	342	373	715	39 7	47·9	52·0
London-road	225	322	287	609	36·9	52·8	47 1
Market-street	199	304	1213	1517	13 1	20 0	79·9
St. George's	496	797	721	1518	32·6	52 5	47·4
Hulme	782	959	913	1872	41·2	51·2	48·5
Chorlton	310	479	567	1046	29 5	45 7	54·2
Ardwick	223	334	319	653	34 1	51 1	48 8
Cheetham	81	146	223	369	21·9	39 5	60·4
Totals............	3295	4541	5357	9898	33·2	45·8	54·1

For the Year 1871.

Names of Sub-districts.	Deaths, 1 year and under.	Deaths, 5 years and under.	Deaths, above 5 years.	Total Deaths.	Rate per cent., 1 yr. and under.	Rate per cent., 5 yrs. and under.	Rate per cent., above 5 years.
Ancoats	599	863	664	1527	39·2	56·5	43·4
Deansgate	295	375	372	737	40·2	49·6	50·3
London-road	276	370	301	671	41·1	55·1	44·8
Market-street	217	303	1176	1479	14 6	20·4	79·5
St. George's	574	915	698	1613	35·5	56·7	43·2
Hulme	974	1215	973	2198	44 3	55 2	44·7
Chorlton	343	526	588	1114	37·9	47·2	52·7
Ardwick	232	346	369	715	32 4	48·3	51·6
Cheetham	97	171	210	381	25·4	55·1	44 8
Totals............	3607	5074	5361	10345	45·8	48·6	51·3

Table *showing the Number of Deaths in each Registraton Sub-district from five Zymotic Diseases, viz., Measles, Smallpox, Whooping Cough, Scarletina, and Fever, and the rate per* 1000 *from those diseases; also the Number of Deaths from other causes, and the rate per* 1000, *during the years* 1868-69.

For the Year 1868.

Names of Sub-districts.	Estimated Population.	No. of Deaths from Zymotic Diseases.	No. of Deaths from Non-Zymotic Diseases.	Total Deaths.	Rate per 1000 of Deaths from Zymotic Diseases.	Rate per 1000 of Deaths from Non-Zymotic Diseases.
Ancoats	53658	342	1478	1820	6·4	27·5
Deansgate	25576	223	794	1017	8·7	31·0
London-road	23764	264	524	788	11·1	22·0
Market-street	19225	301	1343	1644	15·6	69·8
St. George's	55288	377	1331	1708	6·8	25·8
Hulme	72821	418	1622	2040	5·7	22·2
Chorlton	48604	223	881	1104	4·6	18·1
Ardwick	25995	136	627	763	5·2	24·1
Cheetham	20364	58	300	358	2·3	14·8
Totals	345295	2342	8900	11242	6·8	25·7

For the Year 1869.

Names of Sub-districts.	Estimated Population.	No. of Deaths from Zymotic Diseases.	No. of Deaths from Non-Zymotic Diseases.	Total Deaths.	Rate per 1000 of Deaths from Zymotic Diseases.	Rate per 1000 of Deaths from Non-Zymotic Diseases.
Ancoats	53326	249	1449	1698	4·7	27·1
Deansgate	25116	106	650	756	4·2	25·9
London-road	23061	79	564	636	3·1	24·4
Market-street	18611	242	1285	1527	13·0	69·0
St. George's	66321	326	1307	1633	5·7	23·3
Hulme	73448	257	1667	1924	3·5	22·5
Chorlton	49136	116	943	1059	2·4	19·2
Ardwick	26602	103	517	620	3·9	19·4
Cheetham	20781	34	345	379	1·3	16·6
Totals	346402	1505	8727	10232	4·3	25·2

TABLE *showing the Number of Deaths in each Registration Sub-district from five Zymotic Diseases, viz., Measles, Smallpox, Whooping Cough, Scarletina, and Fever, and the rate per* 1000 *from those Diseases; also the Number of Deaths from other causes, and the rate per* 1000, *during the years* 1870-71.

For the Year 1870.

Names of Sub-districts.	Estimated Population.	No. of Deaths from Zymotic Diseases.	No. of Deaths from Non-Zymotic Diseases.	Total Deaths.	Rate per 1000 of Deaths from Zymotic Diseases.	Rate per 1000 of Deaths from Non-Zymotic Diseases.
Ancoats	52994	196	1403	1599	3·7	26·4
Deansgate	21654	57	658	715	1·3	26·2
London-road	22258	74	535	609	3·3	24·1
Market-street	17997	191	1326	1517	10·5	73·1
St. George's	27354	193	1325	1518	3·3	23·1
Hulme	74075	206	1666	1872	2·7	22·4
Chorlton	49662	101	945	1046	2·0	19·0
Ardwick	27209	75	578	653	2·7	21·2
Cheetham	21498	45	332	377	2·0	15·4
Totals	347701	1138	8768	9906	3·3	25·1
	For the Year 1871.					
Ancoats	52654	199	1328	1527	3·8	25·1
Deansgate	24185	59	678	737	2·4	28·0
London-road	21555	67	604	671	3·1	28·0
Market-street	17383	199	1280	1479	11·4	72·6
St. George's	58387	157	1456	1613	2·7	21.7
Hulme	74702	278	1920	2198	3·5	24·5
Chorlton	50194	134	980	1114	2·6	19·5
Ardwick	27816	70	645	715	2·5	22·9
Cheetham	21915	38	343	381	1·8	16·3
Totals	348791	1201	9234	10435	3·4	26·4

The figures show a satisfactory reduction in the mortality from the febrile infectious diseases; but we are liable, from epidemic invasions, to considerable fluctuations from these.

The general mortality also contrasts favourably with many of the preceding years; but it must be borne in mind that the very unfavourable sanitary condition of the city during the many years that preceded the Health Committee's existence, has attenuated the frames and weakened the constitutions of a large portion of its inhabitants, that the progress of improvement in so large a city is necessarily slow, and that even when improvements are effected their influence on a population already debilitated in general health is not immediate. On the diseases, however, most under our control a marked impression has been produced.

I have the honour to be,
Gentlemen,
Your obedient Servant,
John Leigh, M.R.C.S.

January 19th, 1872.

[Appendix.]

Manchester Royal Infirmary and Dispensary, Piccadilly. Opened for Patients, A.D. 1752.

Present number of beds, 250 ; Medical, ; Surgical, .

Patients admitted from June 25th, 1869, to June 24th, 1870 :—

In-patients, including fever-ward patients, 317	2680
Home-patients	3251
Out-patients	19483
Total	25414

Of 2680 In-patients—

968 ......were medical cases.
704 ...... " surgical cases of disease.
1008 ...... " accidents.

Of the 317 Fever ward patients—

81 ......were cases of smallpox.
5 ...... " measles.
22 ...... " scarlet fever.
95 ...... " typhus fever.
29 ...... " typhoid fever.
6 ...... " relapsing fever.
11 ...... " simple continued fever.
24 ...... " febricula.

Residences of the In-patients admitted during the year 1869-70 :—

Manchester, including Ancoats, Ardwick, Cheetham, Hulme, Chorlton-on-Medlock, Bradford, and Rusholme (the two latter not in the city)	1641
Other places	1039

Income—

Subscriptions received	£6685	1	9
Donations	2370	0	7
Interest from investments, dividends, and chief rents	5993	14	7
From apprentices and students	501	18	0
Sundries sold	262	6	1
Services of private nurses	545	1	9
For subsistence of in-patients	182	6	6
For conveyance of fever patients	25	1	6
	£16,565	10	9

General Hospital and Dispensary for Sick Children, Bridge-street and Gartside-street.

Number of beds, 25, of which 5 are set apart for infectious cases.

Patients admitted during the eleven months ending December 31st, 1870,

In-patients	325
Home-patients	751
Out-patients	7197
Total	8273

Of the 325 in-patients—

26	were suffering from	typhus fever.
17	"	typhoid fever.
7	"	scarlet fever.
13	"	febricula.
3	"	diphtheria.
Total 66		

Of the 751 home-patients, 426 were suffering from febrile infectious diseases, viz.:—

107	typhus and typhoid.
217	scarlet fever.
24	measles.
22	smallpox.
5	febricula.
51	diptheria.
Total 426	

Of the 7197 out-patients admitted, 942 were suffering from febrile infectious diseases.

Income for the year 1870:—

Subscriptions	£891	4	10
Donations	1009	4	11
Interest on Permanent Fund	14	16	1
Total	£1915	5	10

Ardwick and Ancoats Dispensary.

A plot of land has been purchased from the Manchester, Sheffield, and Lincolnshire Railway Company, situated in for the erection of a hospital and dispensary, a sum of £5,000. having been given for this purpose by Miss Brackenbury, of Brighton, on condition that the Committee could obtain a site.

It is calculated that for the purchase of the land, furnishing, and incidental expenses, a sum of about £6,000. will be required.

It is expected that the hospital and dispensary will be completed during the ensuing summer. The number of beds to be provided will depend on the amount of subscriptions.

None of these beds will be appropriated to the reception of cases of infectious disease. Patients will be received almost exclusively from Ardwick and Ancoats.

Patients attended during 1870-71 :—

Home-patients	894
Out-patients	1535
Accidents	1517
Total	3946

43rd Report.

Subscriptions and donations for the year ending June 24th, 1871	£556	15	4
Cash at Banker's, in Treasurer's hands, &c.	484	13	0
Total	£1041	8	4

Not in debt.

Manchester Southern Hospital, Clifford-street, Chorlton-on-Medlock, for the diseases of Women and Children.

Number of beds	14
No beds appropriated to cases of infectious disease.	
In-patients admitted during the year ending October, 1871	106
Women admitted on the books	412
Children admitted on the books	1261

It is presumed that the latter are all Home-patients.

Casual-patients—that is—patients prescribed for but not entered on the books for prolonged treatment (Out-patients)	3030
Confinements attended	325

Subscriptions and donations for the year ending October, 1871—

Subscriptions	£412	7	6
Donations	168	0	1½
Total	£580	7	7½

Interest and balance, £290. 12s. 9½d.

Relieved from debt by the proceeds of the bazaar in November, 1870.

(5th Annual Report.)

Chorlton-upon-Medlock, Rusholme, and Moss-side Dispensary.

No beds.

Patients attended during the year ending December 31st, 1870 :—

Home-patients	1225
Out-patients	2183
Total	3408

Inspector's Report of cases refused admission :—

Receiving parish relief	30
Able to pay for medical advice	4
Improper characters	1
Domestic servants	2

	£	s.	d.
Subscriptions (annual)	£297	2	3
Donations, legacies, &c. received during the year	557	8	5
Total	£854	10	8

£287. 10s. being legacies, this sum has been invested.

(45th Annual Report.)

Hulme Dispensary, Trafford-street, adjoining the Hulme Town Hall.

Accommodation for beds. No beds at present occupied.

Patents admitted during the year ending December 31st, 1870 :—

Home-patients	1622
Out-patients	6411
Total	8033

	£	s.	d.
Annual subscriptions	£335	8	6
Patients' payments	13	15	1
Miscellaneous contributions*	156	12	0

* Miscellaneous contributions are donations on account of current annual expenditure.

	£	s.	d.
Bank interest	26	5	9
Balance drawn from reserve fund	1080	11	5

Of this latter sum £800. was expended on building account.

The business of the Institution is now conducted in a commodious new building erected by the Committee at the back of the Hulme Town Hall. Though no beds for patients are at present provided, there is room for 15 or 20. It is intended at some time to provide these for special cases.

(2nd Annual Report.)

St. Mary's Hospital and Dispensary, Quay-street, Manchester, for Women and Children.

Patients admitted during the year 1870 :—

In-patients, cases of disease	493
Home-patients ditto	1389
Out-patients ditto	8093
Pregnant cases, delivered	1538
Total of all kinds of patients	11513

Income—

Subscriptions	£1104	16	6
Donations	557	0	2
Collections at churches, &c.	499	4	6
Receipts from patients	83	0	0
Recommendations sold	107	8	0
Fees received	25	14	6
Mr. Smith's annuity	6	0	0
Interest on investments	582	17	0
Total	£2966	0	8

St. Mary's Hospital is a handsome building, erected by subscription, in Quay-street; it contains 40 beds. No cases of infectious disease are admitted as In-patients. The Hospital was founded in 1790.

Clinical Hospital and Dispensary for Children, Park-place, Cheetham Hill-road.

The Clinical Hospital is a commodious, handsome, and well-arranged building; it contains 24 beds. No cases of infectious disease are admitted. It appears from the Reports that the advantages of the Hospital and Dispensary are not restricted to children, but are extended to poor women.

Patients attended during the year 1870 :—

In-patients—	
Children	121
Women	17
Out-patients—	
Children	3402
Women	1891
Total	5431

Income for the year ending December 31st, 1870:—

	£	s.	d.
Annual subscriptions	£914	12	0
Donations	603	14	9
Interest on investments	56	13	2
Bank interest, &c.	41	12	5
Total receipts	£1616	12	4

The Committee say in their Report for 1870 that the recent epidemic of small-pox shows more than ever the necessity of building the wing.

Clinical Hospital.

Originally designed for contagious diseases, and the Committee can only express a fervent hope that some large-hearted philanthropist may select this good work as a suitable object to carry out. As at present constituted, the expenses of the hospital, estimated at the cost per bed, are disproportionately large, inasmuch as the staff of domestics would be but little increased by the working of an additional wing.

Homœopathic Institution, 28, *Lower Byrom-street*

No beds.

Patients admitted or attended during the year 1868-69......... 1978

Income for the year ending September 30th, 1869—

	£	s.	d.
Subscriptions and donations	£183	6	6
Patients' subscriptions	129	0	6
	£312	7	0

(8th Annual Report.)

Homœopathic Hospital and Dispensary, Bloom-street, Piccadilly.

No beds.

Patients admitted during the year 1870—

Home-patients	706
Out-patients	1546
Total	2252

Income for the year 1870—

	£	s.	d.
Subscriptions	£163	9	6
Donations	108	2	6
Receipts from Patients	204	8	6
Total	£476	0	6

Manchester Royal Eye Hospital.

Number of beds	63

Patients admitted during the year 1870—

In-patients	886
Out-patients	6022
Total	6908

Of the 6022 out-patients admitted—

3395	resided in Manchester.
2627	" other places.

Income for the year 1870—

Subscriptions	£1321	9	0
Donations	467	14	7
Dividends, Interest, &c.	38	19	3
Patients' board and washing	157	14	10
Sundries	30	15	8
Total	2016	13	4

Manchester and Salford Lock Hospital.

Patients admitted during the year 1867—

In-patients	61
Out-patients	1757
Total	1818

Income for the year 1867—

Subscriptions	£408	8	0
Donations	50	13	6
Board of In-patients	58	19	0
Rent of shop	25	0	0
Interest	0	15	1
Total	£543	15	7

Manchester Nurse-Training Institution.

Fifth Annual Report, being for the year ending September 30th, 1870.

Ten nurses are at present employed to attend on the sick poor in ten districts, the cost of forming which and of maintaining the nurses amounts to £1300. per annum, of which is contributed by—

Subscriptions	£431	13	6
Donations	290	15	0

The rest is contributed by the Lady-Superintendents.

In addition to these Institutions are the Medical Mission in Red Bank, the Medical Mission in City-road, the Dispensary for Diseases of the Ear, the Dispensary for Diseases of the Skin, and the Convalescent Hospital at Cheadle, in connection with the Manchester Infirmary.

Summary of cases admitted on the books or the charitable medical institutions of Manchester. The patients residing in Manchester.

In-patients—

Royal Infirmary	1641
Southern Hospital	106
Children's Hospital	325
Clinical Hospital	138
St. Mary's Hospital	493
Eye Hospital	886
Lock Hospital	61
Total	3650

Home-patients—

Royal Infirmary	3251
Southern Hospital	1673
Ardwick and Ancoats Dispensary	894
Children's Hospital and Dispensary	751
St. Mary's Hospital	1389
Chorlton-on-Medlock Dispensary	1225
Hulme Dispensary	1622
Homœopathic Hospital	706
Total	11511

Out-patients—

Royal Infirmary	19483
Ardwick and Ancoats Dispensary	3052
Southern Hospital	3030
Children's Hospital and Dispensary	7197
St. Mary's Hospital	8093
Clinical Hospital	5293
Chorlton Dispensary	2183
Hulme Dispensary	6411
Homœopathic Hospital	1546
Homœopathic Institution	1978
Eye Hospital	6022
Lock Hospital	1757
Total	66045

Total number of cases—

In-patients	3250
Home-patients	11511
Out-patients	65159
Grand Total	79920

Annual Contributions to the Manchester Medical Charities.

Royal Infirmary	£16565	10	9
Ardwick and Ancoats Dispensary	556	15	4
Southern Hospital	580	7	7½
Children's Hospital	1915	5	10
St. Mary's Hospital	2966	0	8
Clinical Hospital	1616	12	4
Chorlton Dispensary	567	0	8
Hulme Dispensary	812	12	9
Homœopathic Institution	312	7	0
Homœopathic Hospital	476	0	6
Eye Hospital	2016	13	4
Lock Hospital	543	15	7
Training Institution	722	8	6
Total	£29651	10	10½

In addition to the medical institutions which are supported by charitable contributions, there are also three large hospitals receiving patients from Manchester under the Poor-Law :—

1. The Manchester Workhouse Hospital, New Bridge-street, which has 601 beds, 90 of which are reserved for infectious cases.

2. The Hospital connected with the New Workhouse at Crumpsall is in connection with the Manchester Union, and contains 231 beds.

3. The Withington Hospital is connected with the Chorlton Union Workhouse, and contains 589 beds, of which 67 are appropriated to infection cases.